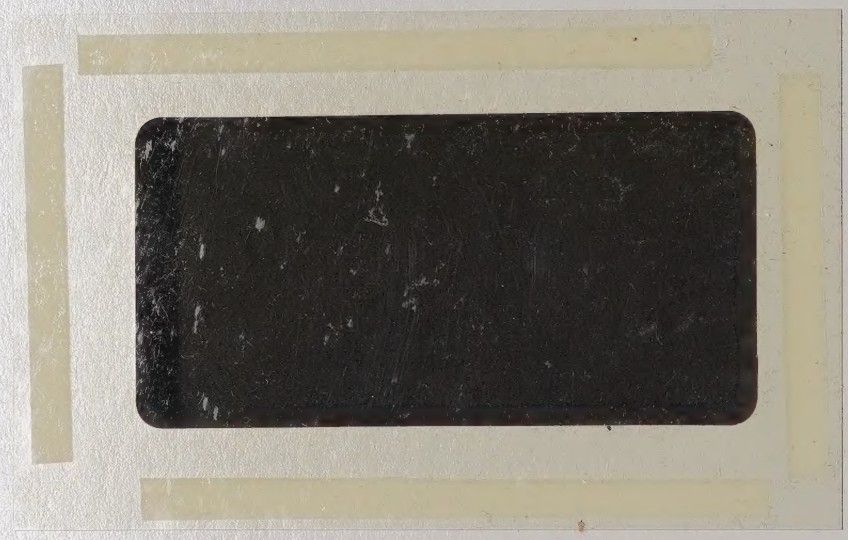
Anritsu

ME3520A/ME3620A
SDH/SONET Analyzer
Operation Manual
SDH Edition

Read this manual before using the equipment.
Keep this manual with the equipment.



ME3520A/ME3620A
SDH/SONET Analyzer
Operation Manual
SDH Edition
Vol. 2

Fifth Edition

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Measuring Instruments Division
Measurement Group
ANRITSU CORPORATION

EB.
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Document No.: M-W0670AE-5.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Insure that you clearly understand the meanings of the symbols BEFORE using the equipment.

Symbols used in manual

DANGER This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

WARNING This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

CAUTION This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

(Some or all of the following five symbols may not be used on all Anritsu equipment. In addition, there may be other labels attached to products which are not shown in the diagrams in this manual.)

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Insure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

ME3520A/ME3620A SDH/SONET Analyzer
Operation Manual SDH Edition Vol. 2

January 1994 (First Edition)
April 1996 (Fifth Edition)

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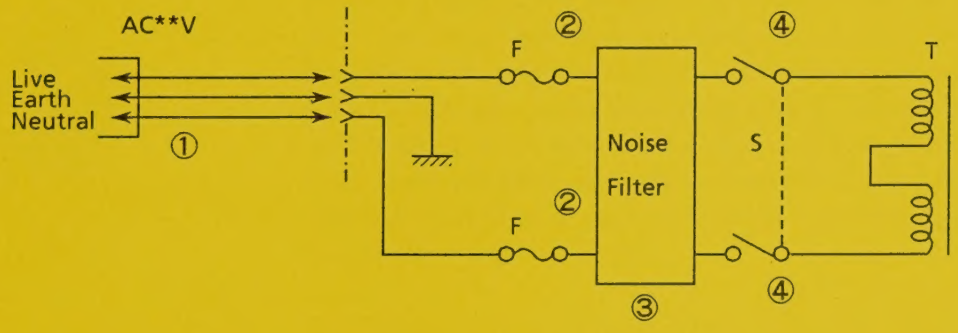
Printed in Japan

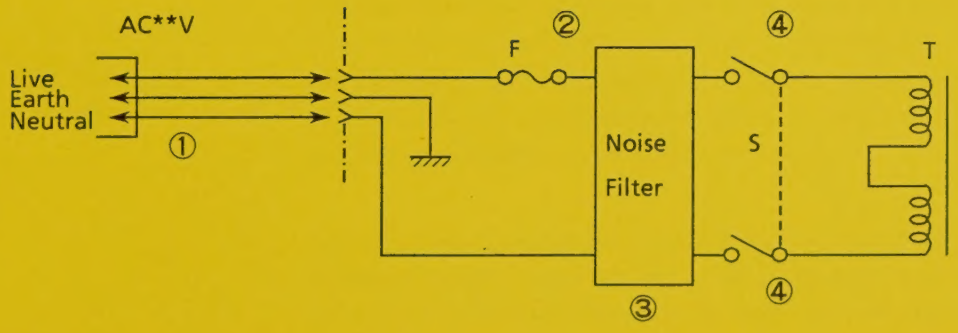
A2. ONE-FUSE MODIFICATION

The Power Supply Circuit for this instrument has been modified as follows. Therefore, when reading this manual, please apply the following information wherever relevant.

1. Description in the manual



2. Modified power supply



Parts being used:

① Power cord
② One fuse holder with a built-in fuse
③ Noise filter
④ Power switch

For Safety

WARNING

1. ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached. If the operation, etc., is performed without heeding the advice in the operation manual, there is a risk of personal injury. In addition, the equipment performance may be reduced.
   Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.

2. When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, before supplying power to the equipment, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Repair

WARNING ⚠

3. This equipment cannot be repaired by the user. DO NOT attempt to open the cabinet or to disassemble internal parts. Only Anritsu-trained service personnel or staff from your sales representative with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision parts.

Falling Over

4. This equipment should be used in the correct position. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.

Laser

5. Laser radiation warning
   - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment. If laser radiation enters the eye, there is a risk of injury.
   - Laser Radiation Markings on a following page shows the Laser Safety label attached to the equipment near the cable connector.

For Safety

CAUTION

Changing Fuse

CAUTION ⚠

1. **Before changing the fuses, ALWAYS remove the power cord from the poweroutlet and replace the blown fuses. ALWAYS use new fuses of the type and rating specified on the fuse marking on the rear panel of the cabinet.**

   10 A or F 10 A indicate a normal fusing type fuse.
   There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.

Cleaning

2. **Keep the power supply and cooling fan free of dust.**
   - **Clean the power inlet regularly. If dust accumulates around the power pins, there is a risk of fire.**
   - **Keep the cooling fan clean so that the ventilation holes are not obstructed. If the ventilation is obstructed, the cabinet may overheat and catch fire.**

3. **Use two or more people to lift and move this equipment, or use a trolley. There is a risk of back injury, if this equipment is lifted by one person.**

Laser Product Safety

1. Safety Specifications

The ME3520A/3620A SDH/SONET Analyzer uses laser light sources as the ME0305A/A1/B/B1 Optical Transmission Unit to measure optical interface units.

SPECIFICATION	CLASSIFICATION
IEC825-1	Class 3A Laser Product
FDA 21 CFR Chapter 1 1040.10	Class ⅢB Laser Product

2. Security Measures

2-1. Label indications

Labels are attached to this unit to indicate the class of the laser. The contents of the labels and their positions on the unit are shown as follows.

- Labels for the IEC 825 specifications.

  Explanatory and Warning labels are attached to this unit.
  The contents of the labels are shown in Table 1.
  Their positions are listed in Figs 1, 2, and 3.

- Labels for the FDA 21 CFR 1040.10 specifications.

  Certification, Identification, Explanatory, and Aperture labels are attached to this unit.
  The contents of the Certification and Identification labels are shown bellow.
  The contents of other labels are shown in Table.1.
  Their positions are shown in Figs 1, 2, and 3.

Certification label

CERTIFICATION LABEL
THIS PRODUCT CONFORMS TO
ALL APPLICABLE STANDARDS
UNDER 21 CFR 1040.10

Identification label

IDENTIFICATION LABEL
ANRISTU CORP.
10-27 MINAMIAZABU 5-CHOME
MINATO-KU, TOKYO 108, JAPAN
MANUFACTURED AT:ANRITSU CORP
ATUGI PLANT. ,19

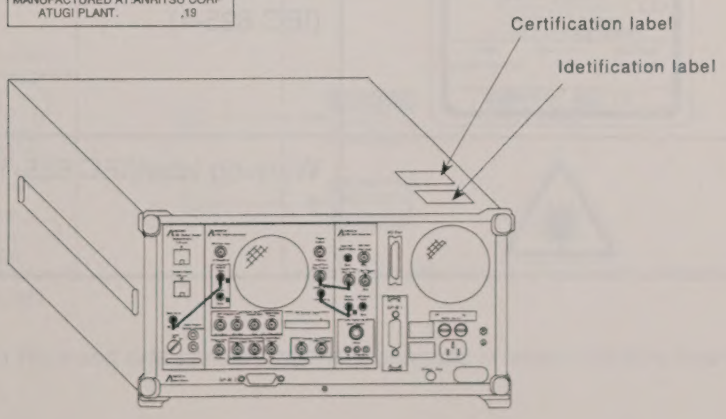


Table 1

No.	Label	Description	Type
①	AVOID EXPOSURE- Invisible Laser radiation is emitted from this aperture	Aperture label (FDA 21 CFR 1040.10)	ME0305A/ A1/B/B1
②	DANGER INVISIBLE LASER RADIATION- AVOID DIRECT EXPOSURE TO BEAM MAX. 10mW PULSE DURATION CW WAVELENGTH 1.31μm/1.55μm CLASS Ⅲb LASER PRODUCT	Explanatory label (FDA 21 CFR 1040.10)	ME0305A/ B
③	INVISIBLE LASER RADIATION DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (MAX) (PULSE DURATION) (WAVELENGTH) 10mW CW 1.31μm/1.55μm CLASS 3A LASER PRODUCT	Explanatory label (IEC 825-1)	ME0305A/ B
④	不可視レーザ光 ビームをのぞきこまないこと 光学機器で直接ビームを見ないこと (最大出力) (パルス幅) (波長) 10mW CW 1.31μm/1.55μm クラス３A レーザ製品	Explanatory label (IEC 825-1)	ME0305A/ B
⑤	DANGER INVISIBLE LASER RADIATION- AVOID DIRECT EXPOSURE TO BEAM MAX. 10mW PULSE DURATION CW WAVELENGTH 1.31μm/1.55μm CLASS Ⅲb LASER PRODUCT	Explanatory label (FDA 21 CFR 1040.10)	ME0305A1/ B1
⑥	INVISIBLE LASER RADIATION DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS (MAX) (PULSE DURATION) (WAVELENGTH) 10mW CW 1.31μm/1.55μm CLASS 3A LASER PRODUCT	Explanatory label (IEC 825-1)	ME0305A1/ B1
⑦	不可視レーザ光 ビームをのぞきこまないこと 光学機器で直接ビームを見ないこと (最大出力) (パルス幅) (波長) 10mW CW 1.31μm/1.55μm クラス３A レーザ製品	Explanatory label (IEC 825-1)	ME0305A1/ B1
⑧		Warning label(IEC 825-1)	ME0305A/ A1/B/B1

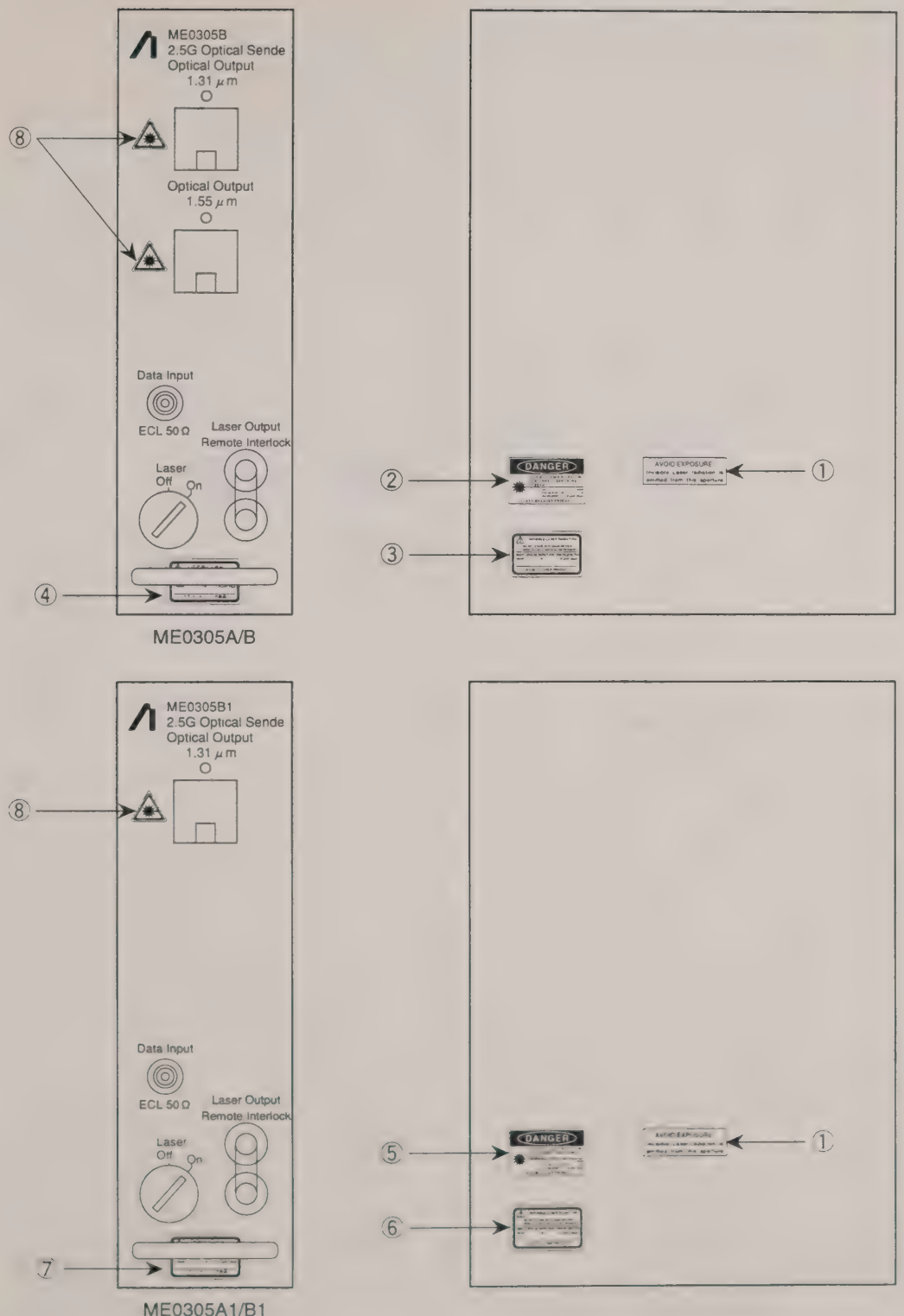


Fig. 1 ME0305A/A1/B/B1 front and side panels (Japanese products of which shipping country is Japan)

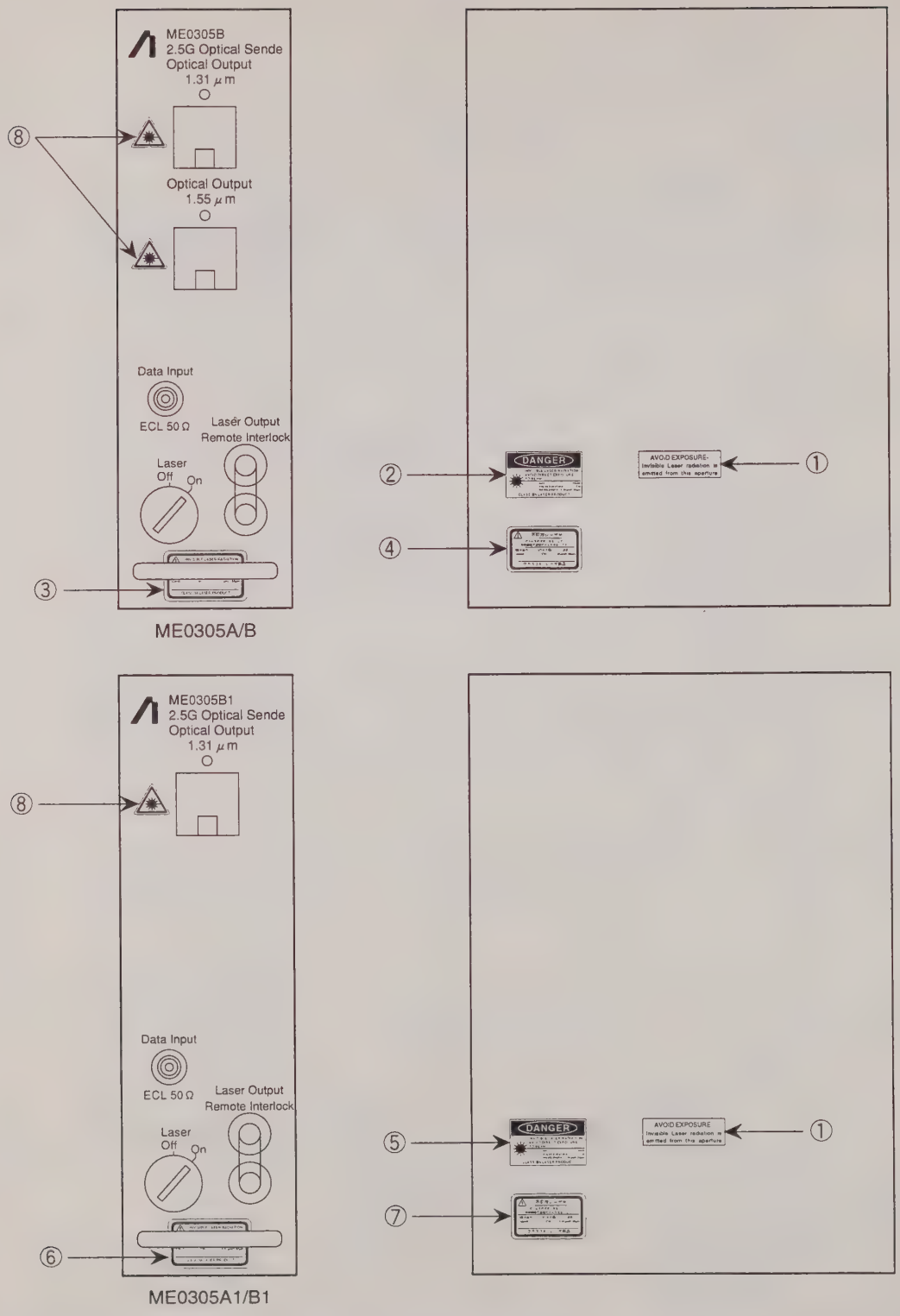


Fig. 2 ME0305A/A1/B/B1 front and side panels (Overseas products of which shipping country is not U.S.A.)

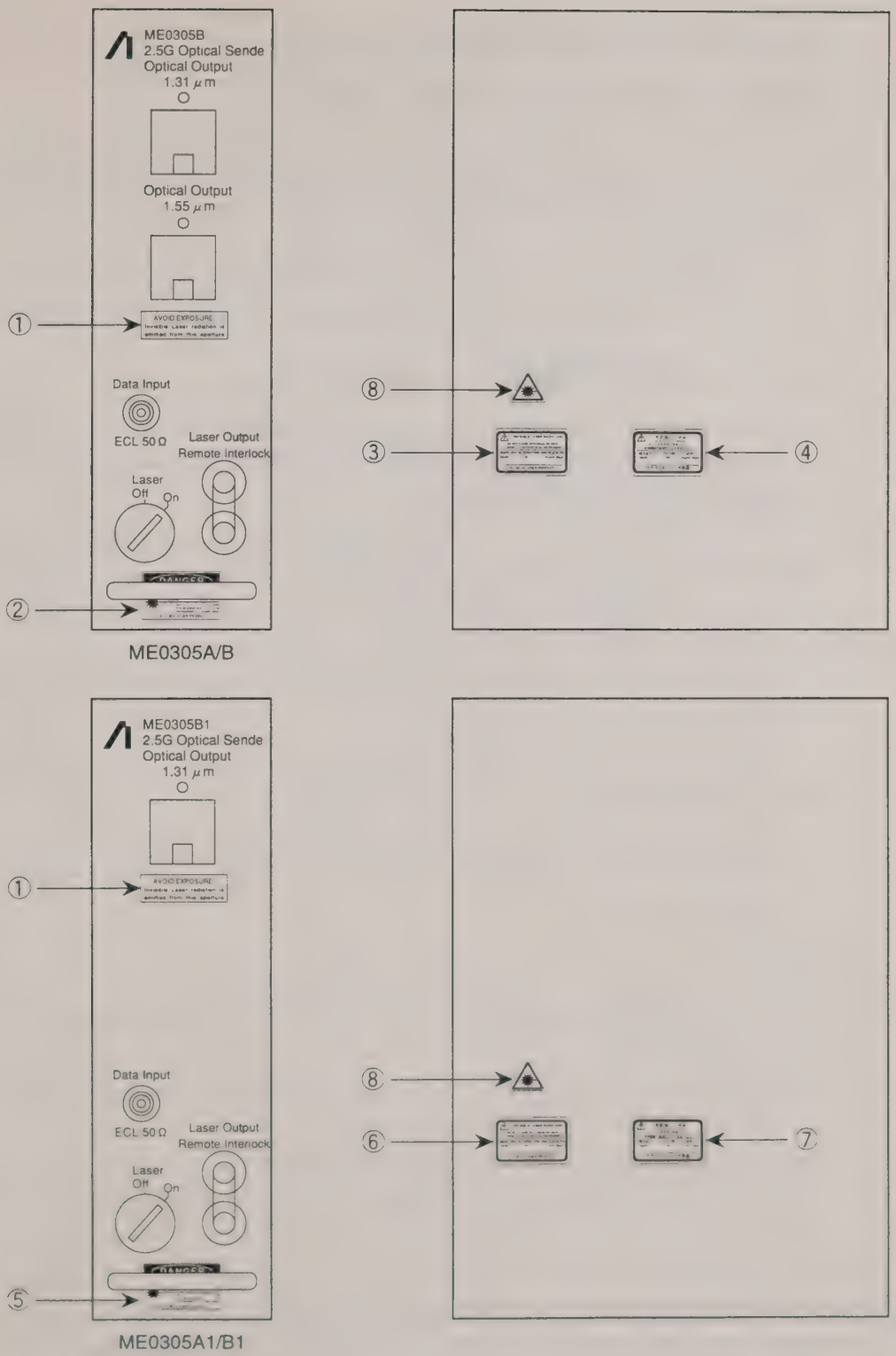


Fig. 3 ME0305A/A1/B/B1 front and side panels (Products of which shipping country is the U.S.A.)

2-2. Security Measure Functions

This unit is provided with the following security measure functions to prevent the possibility of inflicting bodily injury on operators.

- Laser cut-off

  When the cable is disconnected from the optical output section, the protective cover closes and the laser emission stops.

- Laser output key lock

  The laser output is mainly controlled by the key switch of the laser On/Off. When the switch is set to the OFF position, the key can be removed. In this state, the laser is locked off.

- Remote control using the remote interlock connectors

  To ensure safe control of the laser output from a remote location, the laser output can be controlled using the remote interlock connectors of the Laser Output Remote Interlock section.

  When both the ends of these two connectors (white and black) are connected electrically, the laser can be emitted. When both the ends are disconnected, it is not possible to emit the laser. For the voltage of the open end, the potential is +5 V at the white connector for the black connector.

  The laser output can be controlled by any equipment with a 0/+5 V interface.

- Laser emission indicators

  These indicators on the optical output light while laser is being emitted.

- Laser output warning

  When the laser is set to ON, the laser emission indicator lights as a warning for 3 to 4 seconds before laser is actually emitted. The laser is not emitted during this period.

2-3. Handling

The following safety precautions should be observed when handling the ME0305A/A1/B/B1 Optical Unit:

- Before installing/removing this unit in/from the main frame, always make sure the main frame power switch is set to OFF.
- Before connecting/disconnecting a cable to/from the optical output section of this unit, always be sure to set the Laser On/Off key switch to OFF.

Warning

Do not look directly into the end of any cable connected to the optical output connector of the unit. Laser light can seriously damage the eyes. Operating this unit in a procedure other than that as described above might result in injury or damage from laser emission. Please follow the handling instructions carefully.

Equipment Certificate

Anritsu Corporation certifies that this equipment was tested before shipment using calibrated measuring instruments with direct traceability to public testing organizations recognized by national research laboratories including the Electrotechnical Laboratory, the National Research Laboratory and the Communication Research laboratory, and was found to meet the published specifications.

Anritsu Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within 1 year after shipment due to a manufacturing fault, provided that this warranty is rendered void under any or all of the following conditions.

- The fault is outside the scope of the warranty conditions described in the operation manual.
- The fault is due to misoperation, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster including fire, flooding and earthquake, etc.
- The fault is due to use of non-specified peripheral equipment, peripheral parts, consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation will not accept liability for equipment faults due to unforeseen and unusual circumstances, nor for faults due to mishandling by the customer.

Anritsu Corporation Contact

If this equipment develops a fault, contact Anritsu Corporation or its representatives at the address in this manual.

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– Note –

When reading this operation manual, note the followings, beforehand.

1. When using the ME0303A/B Jitter Generator and ME0313A/B Jitter Detector, read the descriptions related to the ME0303C/D Jitter Generator and ME0313C/D Jitter Detector, in this manual.
   Note the following points.
   (1) The ME0303A/B has not the Local Output connector.
   (2) The ME0313A/B has not the Local Input connector.
   (3) In the Jitter transfer measurement, only the Broad-band measurement can be performed. In the item of the Transfer meas. method:, only the Broad-band can be selected, or the item is not displayed.

2. When the Jitter-transfer measured results are saved in a floppy disk using the ME3520A/ ME3620A with the software Rev. 3.2 or later, the ME3520A/ME3620A with the software before Rev. 3.2 cannot display the measured results data.
   This is because the data accuracy is improved for the ME0303C/D Jitter Generator and the ME0313C/D Jitter Detector.

3. If your ME3520A/ME3620A does not meet to the G.826 Error Analysis measurement because of the hardware version, you cannot select and display the Error performance data (G.826) subscreen.

4. The following units are special order-made products.
   Please ask the details to Anritsu for confirmation before ordering.

   Transmitter:

ME0304C	622M Pattern Generator
ME0307A	Multi-interface Sender

   Receiver:

ME0314C	622M Error Detector
ME0317A	Multi-interface Receiver
ME0315D	2.5G Optical Receiver

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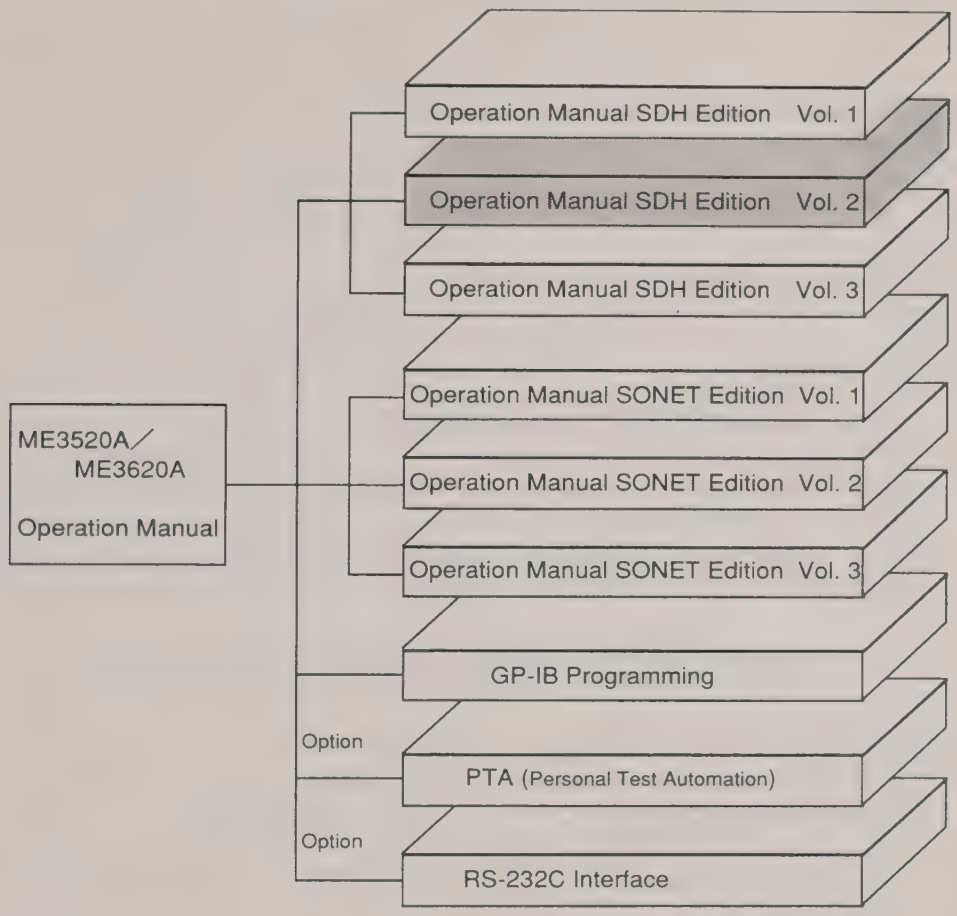
Composition of ME3520A/ME3620A Operation Manuals

This ME3520A/ME3620A Operation Manuals are composed of the following five editions. Read each part in accordance with the intended usage.



Operation Manual SDH Edition
Operation Manual SONET Edition : Outline of ME3520A/ME3620 and preparations before use Explanation of panels, specifications, functions and operation method.

GP-IB Programming : Description of GP-IB remote control based on IEEE488.2, and programming example.

PTA (Personal Test Automation) : Description of programming direct measurement control and computations in high-level language (PTL).
This can be performed using the ME3520A/ME3620A internal personal computer and is called PTA (Personal Test Automation) . It facilitates automation of measurement equipment using the GP-IB described above. It is an option.

RS-232C Interface : Description of RS-232C serial interface control, and programming example. It is an option.

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SECTION 5

TRANSMITTER OPERATION

SECTION 5 TRANSMITTER OPERATION
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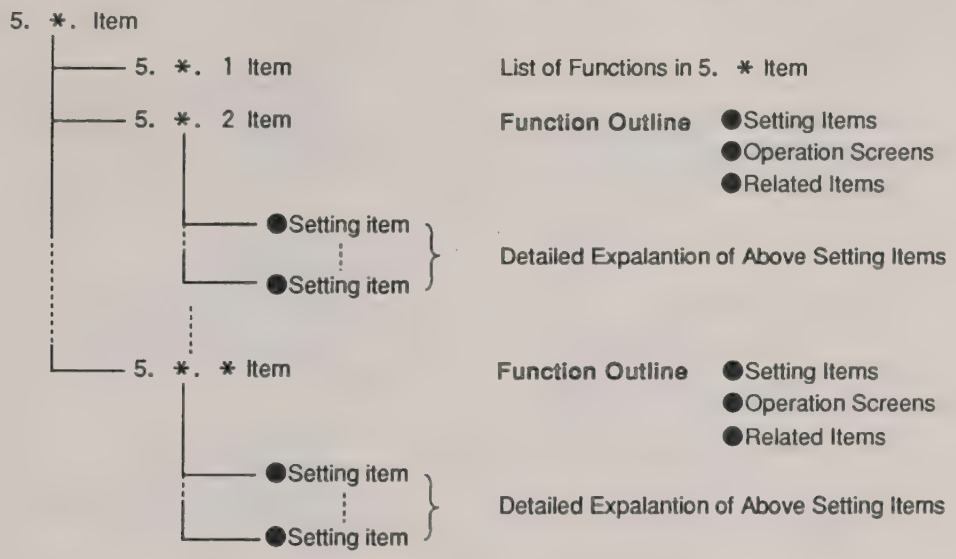
5.1 Introduction

The transmitter operation explanation is composed of the 15 items in sections 5.2 to 5.17 as shown in the transmitter function block diagram. Each item is described on the common format shown below.

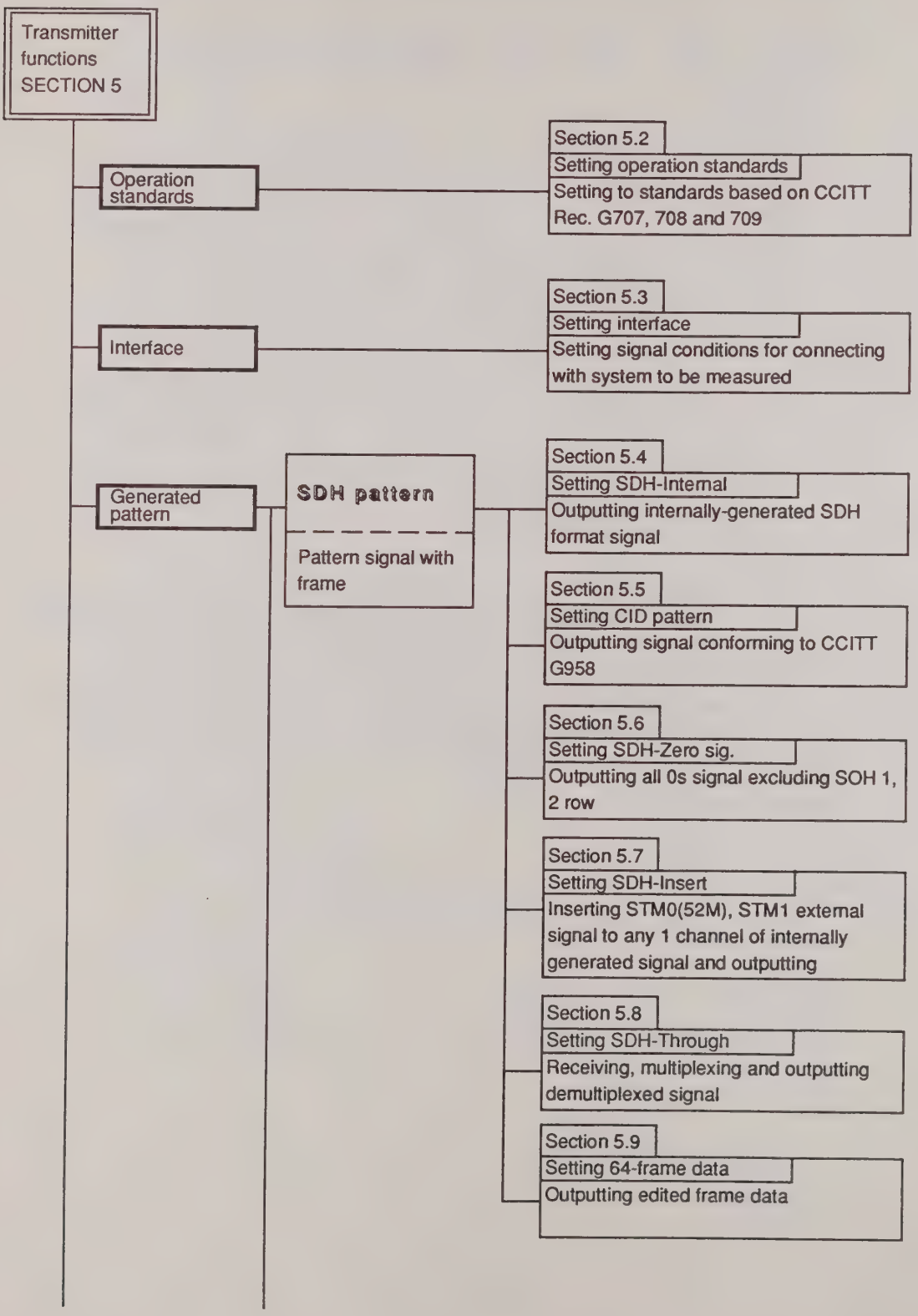
[Description Format] Item architecture and description are as follows:

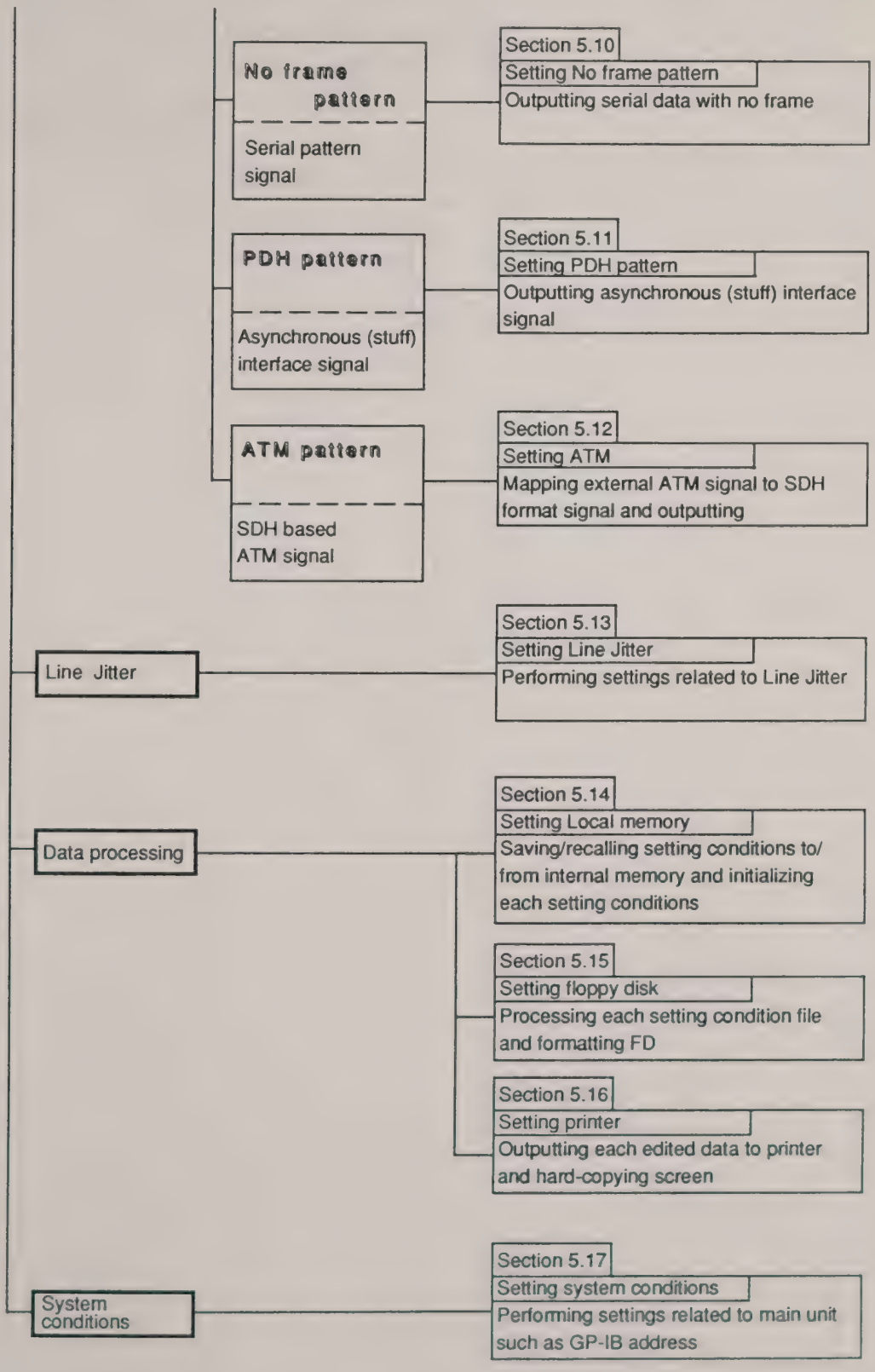


However, the transmitter operations are restricted by both the setting status and the option status. As a result, the setting range may be limited or there may be items that cannot be set .

Each explanation of the setting items does not consider the above restrictions. However, when there are a number of restrictions, the restriction items are described as a *Note* to which you should refer.

[Construction of Transmitter Function]

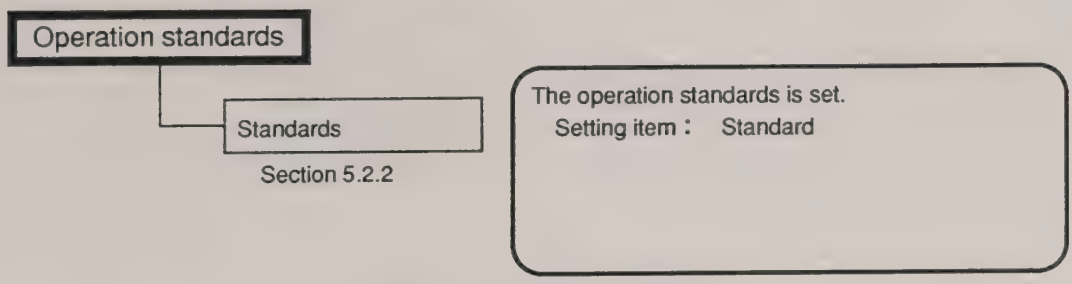



No frame pattern
Serial pattern signal
Section 5.10
Setting No frame pattern
Outputting serial data with no frame
PDH pattern
Asynchronous (stuff) interface signal
Section 5.11
Setting PDH pattern
Outputting asynchronous (stuff) interface signal
ATM pattern
SDH based ATM signal
Section 5.12
Setting ATM
Mapping external ATM signal to SDH format signal and outputting
Line Jitter
Section 5.13
Setting Line Jitter
Performing settings related to Line Jitter
Data processing
Section 5.14
Setting Local memory
Saving/recalling setting conditions to/ from internal memory and initializing each setting conditions
Section 5.15
Setting floppy disk
Processing each setting condition file and formatting FD
Section 5.16
Setting printer
Outputting each edited data to printer and hard-copying screen
System conditions
Section 5.17
Setting system conditions
Performing settings related to main unit such as GP-IB address

5. 2 Setting Operation Standards

5. 2. 1 List of functions

The standards are set based on CCITT Rec. G707, 708 and 709.
A list of the functions in the operation standard settings is displayed.



5. 2. 2 Setting standards

The standards are set here.

[Setting item] The following item is set.

● Standard

[Operation screen] The settings can be performed on the following screen.

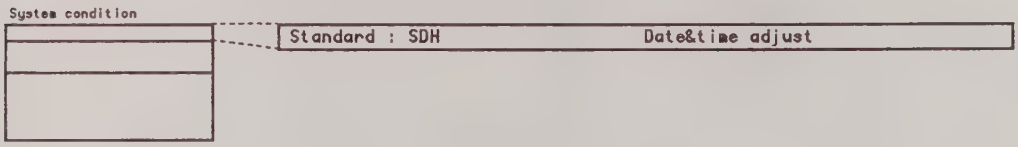


Fig. 5.2-1 Standards setting screen

[Related items] The following items are affected.

- Initialization of all setting items except system conditions
- Initialization of each type of edited data
- Clearing of setting local memory

Note: The above items are initialized only when the standards are changed. However, when the standard is already set to SDH, initialization is not performed when SDH is set again.

Standard Sets the standard at 1.
Setting range is as follows:

[Setting range] SDH

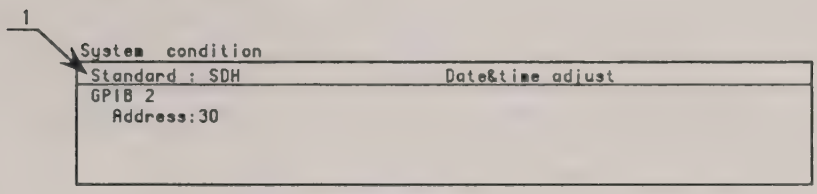


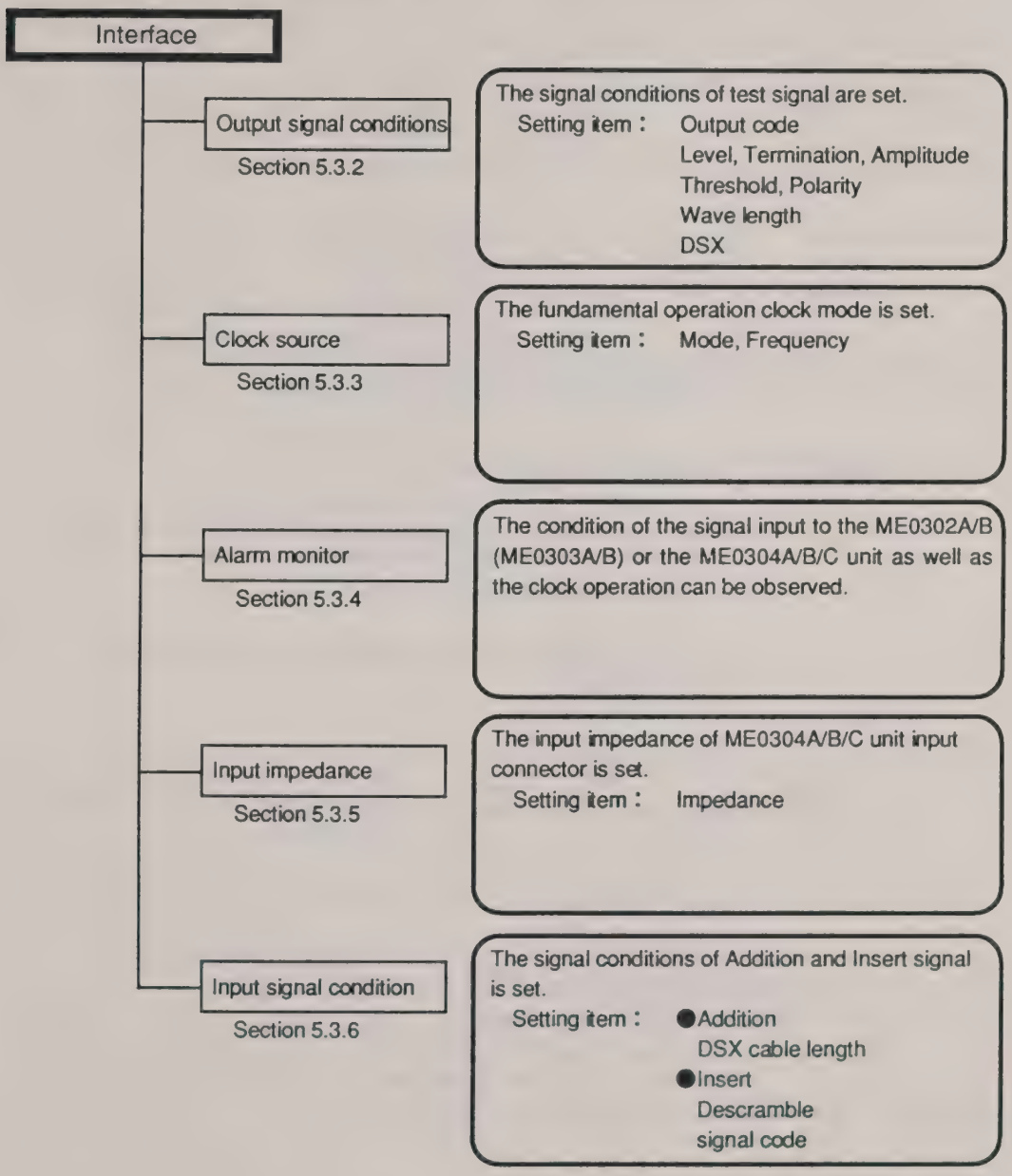
Fig. 5.2-2 Standard setting

Note: When the standard sets SONET, sees the Operation Manual SONET Edition please.

5. 3 Setting Interface

5. 3. 1 List of functions

Each type of signal condition is set for connecting with the system to be measured.
The interface functions are displayed as a list.



5. 3. 2 Setting output signal conditions

The signal conditions of the output test signal are set here.

[Setting items] The following items are set.

- Unipolar signal
- Optical signal
- CMI/B3ZS signal
- PDH signal

[Operation screen] The settings can be performed on the following screen.

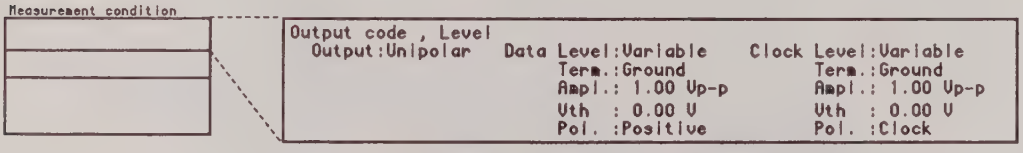


Fig. 5.3-1 Signal condition setting screen

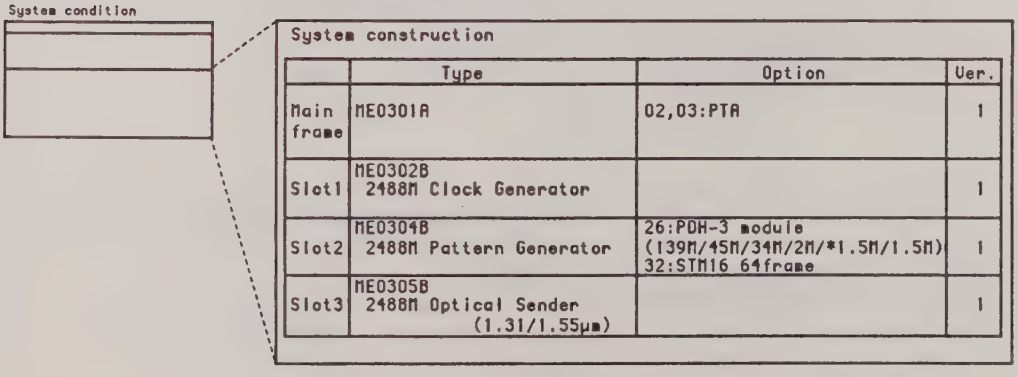
[Related items] The following items are affected.

Unit conditions: Type of unit installed in slot 3

Option conditions: Presence/absence of ME0304A/B/C electrical option-25 or 26

Generated pattern: Bit rate

However, the unit and options installation conditions can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302B 2488M Clock Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.3-2 Related screen

● Unipolar Signal

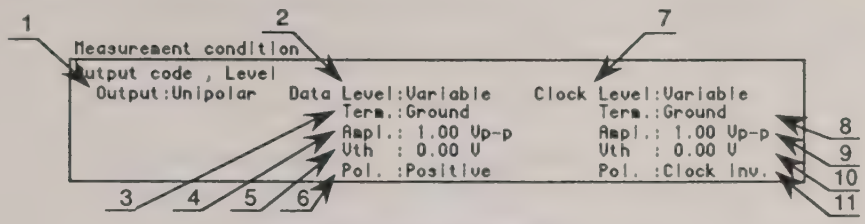


Fig. 5.3-3 Unipolar settings

Output — Sets the Output code at 1.

[Setting range] Unipolar

Note: Unipolar can be set when the Bit rate of generated pattern is 52M, 156M, 622M or 2488M.

Data Level — Sets the Level of unipolar data signal at 2.
The setting range is as follows:

[Setting range] ECL
0 / -1V
Variable

Data Term. — Sets the termination condition of unipolar data signal at 3.
The setting range is as follows:

[Setting range] Ground
-2V

Note: Setting range has following restrictions according to the Data Level 1:
- 'Ground' cannot be set when Data Level is ECL.
- '-2V' cannot be set when Data Level is 0/-1V.

Data Ampl.

Sets the amplitude of unipolar data signal at 4.
The setting range is as follows:

[Setting range] 0.50 ~ 2.00 Vp-p / step 0.01

Note: Data Ampl. 4 is fixed at 1.00Vp-p when Data Level 2 is ECL or 0/-1V.

Data Vth

Sets the threshold voltage of unipolar data signal at 5.
The setting range is as follows:

[Setting range] -3.00 ~ 1.75 V / step 0.01

Note: Setting range has following restrictions according to the Data Level 2:
- Data Vth is fixed at -1.30 when Data Level is ECL.
- Data Vth is fixed at -0.50 when Data Level is 0/-1V.

Data Pol.

Sets the polarity of unipolar data signal at 6.
The setting range is as follows:

[Setting range] Positive
Negative

Clock Level

Sets the level of unipolar clock signal at 7.
The setting range is as follows:

[Setting range] ECL
0 / -1V
Variable

Clock Term.

Sets the termination condition of unipolar clock signal at 8.
The setting range is as follows:

[Setting range] Ground
-2V

Note:

Setting range has following restrictions according to the Clock Level 7:
- 'Ground' cannot be set when Clock Level is ECL.
- '-2V' cannot be set when Clock Level is 0/-1V.

Clock Ampl.

Sets the amplitude of unipolar clock signal at 9.
The setting range is as follows:

[Setting range] 0.50 ~ 2.00 Vp-p / step 0.01

Note:

Clock Ampl. 9 is fixed at 1.00Vp-p when Clock Level 7 is ECL or 0/-1V.

Clock Vth

Sets the threshold voltage of unipolar data signal at 10.
The setting range is as follows:

[Setting range] -3.00 ~ 1.75 V / step 0.01

Note:

Setting range has following restrictions according to the Clock Level 7:
- Clock Vth is fixed at -1.30 when Clock Level is ECL.
- Clock Vth is fixed at -0.50 when Clock Level is 0/-1V.

Clock Pol.

Sets the polarity of unipolar Clock signal at 11.
The setting range is as follows:

[Setting range] Positive
Negative

● Optical Signal

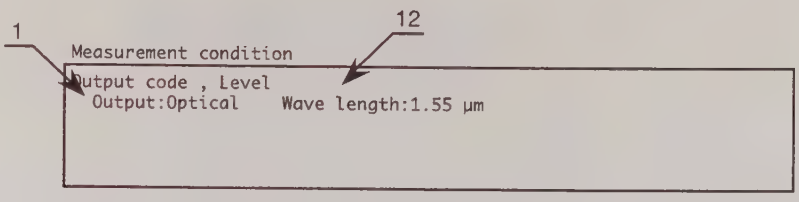


Fig. 5.3-4 Optical settings

Output Sets the Output code at 1.
The setting range is as follows:

[Setting range] Optical

Note: Following optical unit is required to mount on the slot 3 according to the Bit rate of generated pattern:

52M, 156M, 622M	:	ME0305A/A1/B/B1
2488M	:	ME0305B/B1
156M,622M	:	ME0307A
Except above	:	Non optical unit when the bit rate is .

Wave length Sets the Wave length of optical signal at 12.
The setting range is as follows:

[Setting range] 1.31 μm
1.55 μm

Note: '1.55 μm' can be set when the ME0305A/B or ME0307A unit is mounted on the slot 3.

● CMI/B3ZS Signal

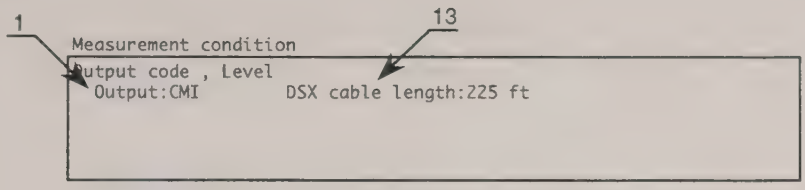


Fig. 5.3-5 CMI/B3ZS settings

Output Sets the Output code at 1.
The setting range is as follows:

[Setting range] CMI
B3ZS

Note:

1. CMI can be set when the ME0306A or ME0307A is installed in slot 3. B3ZS can be set when the ME0307A is installed in slot 3.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	B3ZS
156 M	CMI
Except above	Unsettable

DSX cable length Sets the DSX cable length at 13.
The setting range is as follows:

[Setting range] 0 ft
225 ft
450 ft
900 ft

Note: Setting range has following restrictions according to the Output 1.

Output	Setting range
CMI	0 ft , 225 ft
B3ZS	0 ft , 450 ft , 900 ft

● PDH Signal

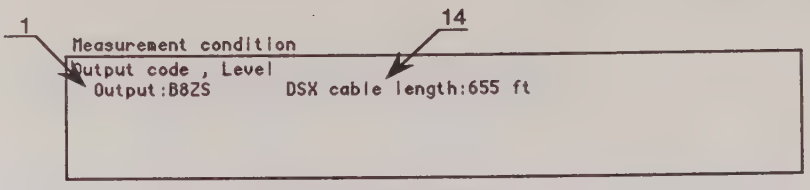


Fig. 5.3-6 PDH Signal settings

Output — Sets the Output code at 1.
The setting range is as follows:

[Setting range] CMI : PDH 139 M
HDB3 : PDH 2 M/34 M
B8ZS : PDH 1.5M

Note:

1. PDH signal can be set when option-25,26 is installed and Bit rate of generated pattern is 139M, 34M, 2M or 1.5M.
2. Setting range has following restrictions according to Bit rate of generated pattern.

Bit rate	Setting range
139 M	CMI
34 M	HDB3
2 M	HDB3
1.5 M	B8ZS
Except above	Unsettable

DSX cable length — Sets the DSX cable length at 14.
The setting range is as follows:

[Setting range] 0 ft
655 ft

Note: DSX cable length 14 can be set when the Output 1 is B8ZS.

5. 3. 3 Setting clock source

The fundamental operation clock mode is set here.

[Setting items] The following items are set.

- Clock 1
- PDH freq.

[Operation screen] The setting can be performed on the following screen.

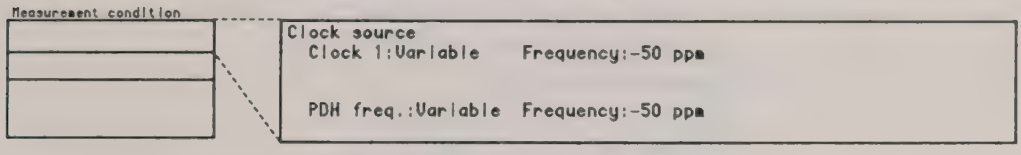


Fig. 5.3-7 Clock source setting screen

[Related items] The following items are affected.

Generated pattern:	Bit rate
Test pattern:	Information pattern/Frame

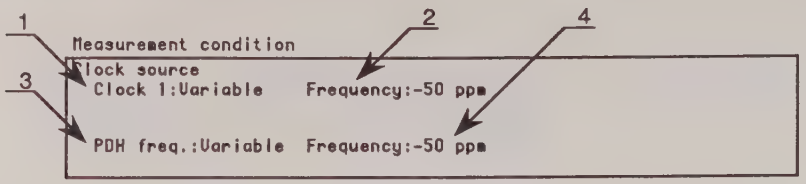


Fig. 5.3-8 Clock source settings

Clock 1 Sets the operating clock of Clock Generator unit at 1.
The setting range is as follows:

[Setting range] Fixed
Variable
Locked
External
Insert
Through

Note: Setting range has following restrictions according to the type of generated pattern.

Type	Setting range					
	Fixed	Variable	Locked	External	Insert	Through
SDH-Internal CID pattern No frame pattern PRGM frame data	○	○	○	○	×	×
SDH-Insert	×	×	×	×	○	×
SDH-Through	×	×	×	×	×	○
Except above	Unsettable					

○ : Settable

Frequency Sets the offset value of clock frequency at 2.
The setting range is as follows:

[Setting range] -50 ～ +50 ppm ／ step 1

Note: Frequency 2 can be set when Clock 1 1 is Variable.

PDH freq.

Sets the PDH clock at 3.
The setting range is as follows:

[Setting range] Fixed
Variable

Note:

1. Setting of PDH freq. 3 needs electrical option-25 or 26.
2. Setting range has following restrictions.

Bit rate	Unit	Format	Info. pattern	PRBS frame
52 M 156 M 622 M 2488 M	VC11 VC11(TU12)	Async. Bit float.	Except Add	(Don't care)
		Byte float.		Framed
	VC12	Async. Bit float.		(Don't care)
		30/31ch float.		Framed
	VC3(TU3)	34 M Async.		(Don't care)
	VC4	139 M Async.		
1.5 M	(Don't care)			
2 M				
34 M				
139 M				

Frequency

Sets the offset value of clock frequency at 4.
The setting range is as follows:

[Setting range] -50 ~ +50 ppm / step 1

Note:

Frequency 4 can be set when PDH freq. 3 is Variable.

5. 3. 4 Alarm monitor

The condition of the signal input to the ME0302A/B (ME0303A/B) or the ME0304A/B/C unit as well as the clock operation can be observed.

[Monitor items] The following items can be observed.

ME0302A/B (ME0303A/B)

- ● External clock signal : External clock loss
- ● Lock signal : Lock signal loss
- ● Clock operation : Unlock

ME0304A/B/C

- ● Insert signal : Insert signal loss
  : Insert OOF
- ● Addition signal : Add signal loss
  : Add out of range

[Operation screen] The items can be monitored on the following screen.

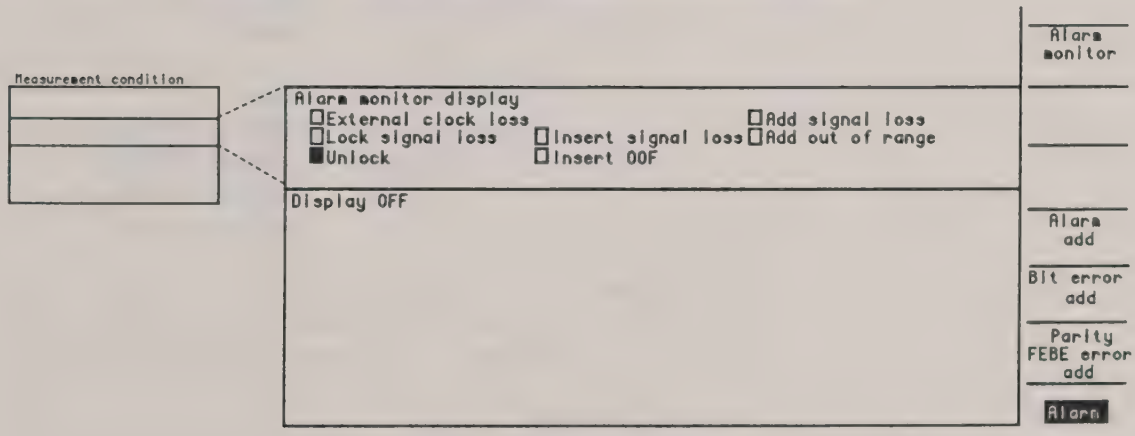


Fig. 5.3-9 Alarm monitor screen

Note:

1. When an abnormality is generated in the monitor items, the front portion of item label is displayed reversely. In addition, the Alarm monitor notification area is displayed.
2. Addition signal monitors need electrical option-25 or 26.

[Related items] The following items are affected.

Generated pattern	: Type
Test pattern	: Info. pattern
Clock source	: Clock1

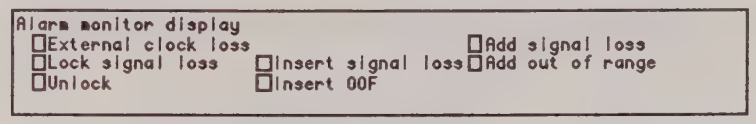


Fig. 5.3-10 Alarm monitor

Alarm Monitors clock or signal condition.
Detection items, Display format and Detection/Release conditions are as follows:

[Detection items]

External clock loss	: Clock lost of external clock signal
Lock signal loss	: Signal lost of lock signal (64k/1.5M/2M)
Unlock	: Lock lost of internal PLL circuit
Insert signal loss	: Signal lost of insert signal
Insert OOF	: Frame lost of insert signal
Add signal loss	: Signal lost of Add signal
Add out of range	: Add signal frequency deviation is out of justification range

[Display format]

☐ Unlock : Alarm release (Normal display)
■ Unlock : Alarm detection (Reverse display)

[Detection／Release]

Item	Condition	Alarm Detection/Release Conditions
External clock loss	Detect	When clock signal lost
	Release	When clock signal input
Lock signal loss	Detect	When lock signal lost
	Release	When lock signal input
Unlock	Detect	When PLL lock lost
	Release	When PLL lock regained
Insert signal loss	Detect	When clock or data signal lost
	Release	When clock or data signal input
Insert OOF	Detect	When error received for 5 continuous frame
	Release	When no error received for 2 continuous frame
Add signal loss	Detect	When data signal lost
	Release	When data signal input
Add out of Range	Detect	When out of range that Add signal frequency deviation can be cope with justification
	Release	When within range that Add signal frequency deviation can be cope with justification

Note:

1. External clock loss can be monitored when clock source Clock 1 is External.
2. Lock signal loss can be monitored when clock source Clock 1 is locked.
3. Unlock can be monitored when Clock source Clock 1 is Locked, Through or Insert.
4. Insert signal loss can be monitored when the generated pattern Type is SDH-Insert.
5. Insert OOF can be monitored when the generated pattern Type is SDH-Insert.
6. Add signal loss and Add out of range can be monitored when the test pattern information pattern is Add.

5. 3. 5 Setting input impedance

The input impedance of the ME0304A/B unit connectors can be set here.

[Setting item] The following item can be set.

- ● Impedance
  - SOH/POH Data Input connector
  - Control Input Error connector
  - Control Input Alarm/Trigger connector

[Operation screen] The settings can be performed on the following screen.

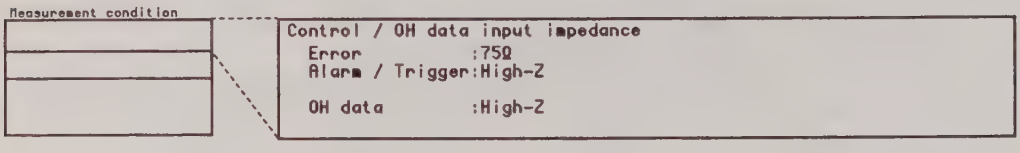


Fig. 5.3-11 Input impedance setting screen

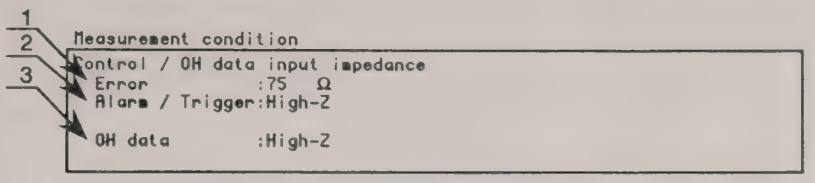


Fig. 5.3-12 Impedance settings

Error — Sets the input impedance of Control Input Error connector at 1.
The setting range is as follows:

[Setting range] 75Ω
High-Z

Alarm / Trigger — Sets the input impedance of Control Input Alarm/Trigger connector at 2.
The setting range is as follows:

[Setting range] 75Ω
High-Z

OH data — Sets the input impedance of SOH/POH Data Input connector at 3.
The setting range is as follows:

[Setting range] 75Ω
High-Z

5. 3. 6 Setting input signal condition

The signal condition of input signal for Addition or Insert is set here.

[Setting item] The following item can be set.

- ● Addition signal
  - DSX cable length
- ● Insert signal
  - Descramble
  - Code

[Operation screen] The settings can be performed on the following screen.

Fig. 5.3-13 Input signal condition setting screen

Note: Addition setting needs electrical option-25 or 26.

[Related items] The following items are affected.

Generated pattern	:	Type
Route setting	:	Unit
Test pattern	:	Info. pattern

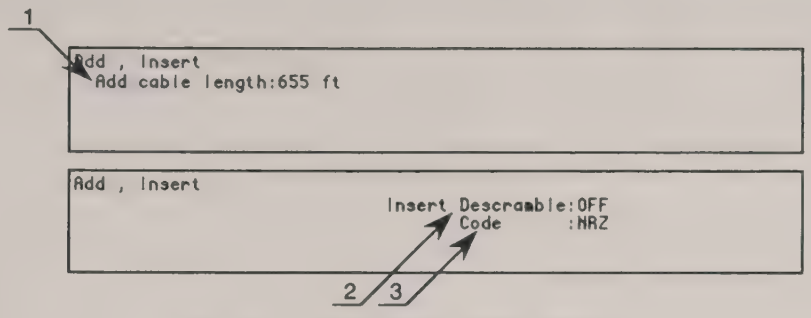


Fig. 5.3-14 Input signal condition settings

Add cable length

Sets the DSX cable length of Addition signal at 1.
The setting range is as follows:

[Setting range] 0 ft
655 ft

Note: Add cable length 1 can be set when route setting unit is VC11 or VC11 (TU12) and test pattern Info. pattern is Add.

Insert Descramble

Sets the descramble of insert signal at 2.
The setting range is as follows:

[Setting range] ON
OFF

Note: Descramble 2 can be set when clock source clock 1 is Insert.

Code

Sets the input impedance of SOH/POH Data Input connector at 3.
The setting range is as follows:

[Setting range] NRZ
B3ZS
CMI

Note: Setting range have following restrictions according to the route setting Unit and Format.

Unit	Format	Setting range		
		NRZ	*B3ZS	*CMI
STM0 (52M)	Insert	○	○	×
STM1		○	×	○

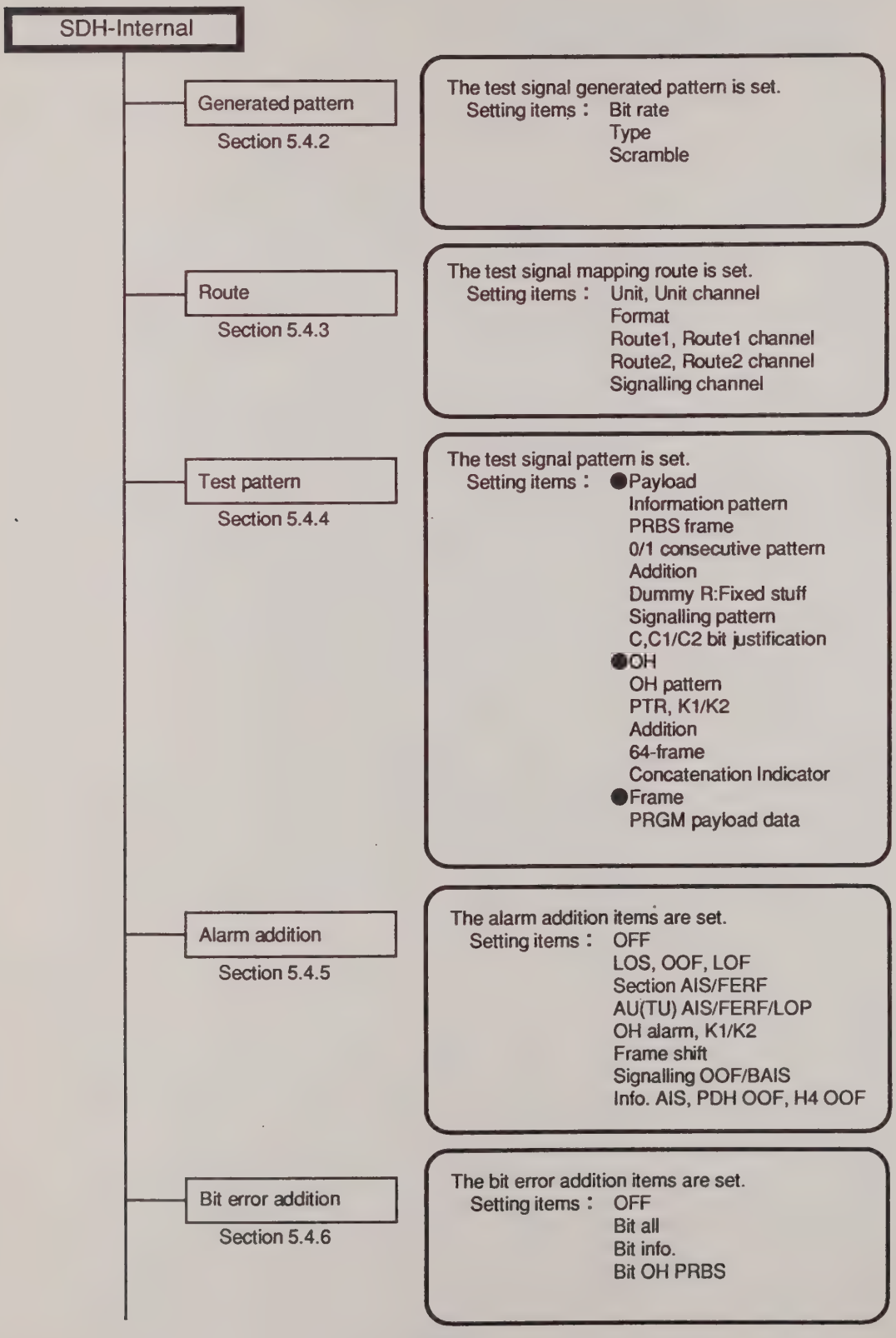
* : This is possible only when electrical option 25 or 26 mounted

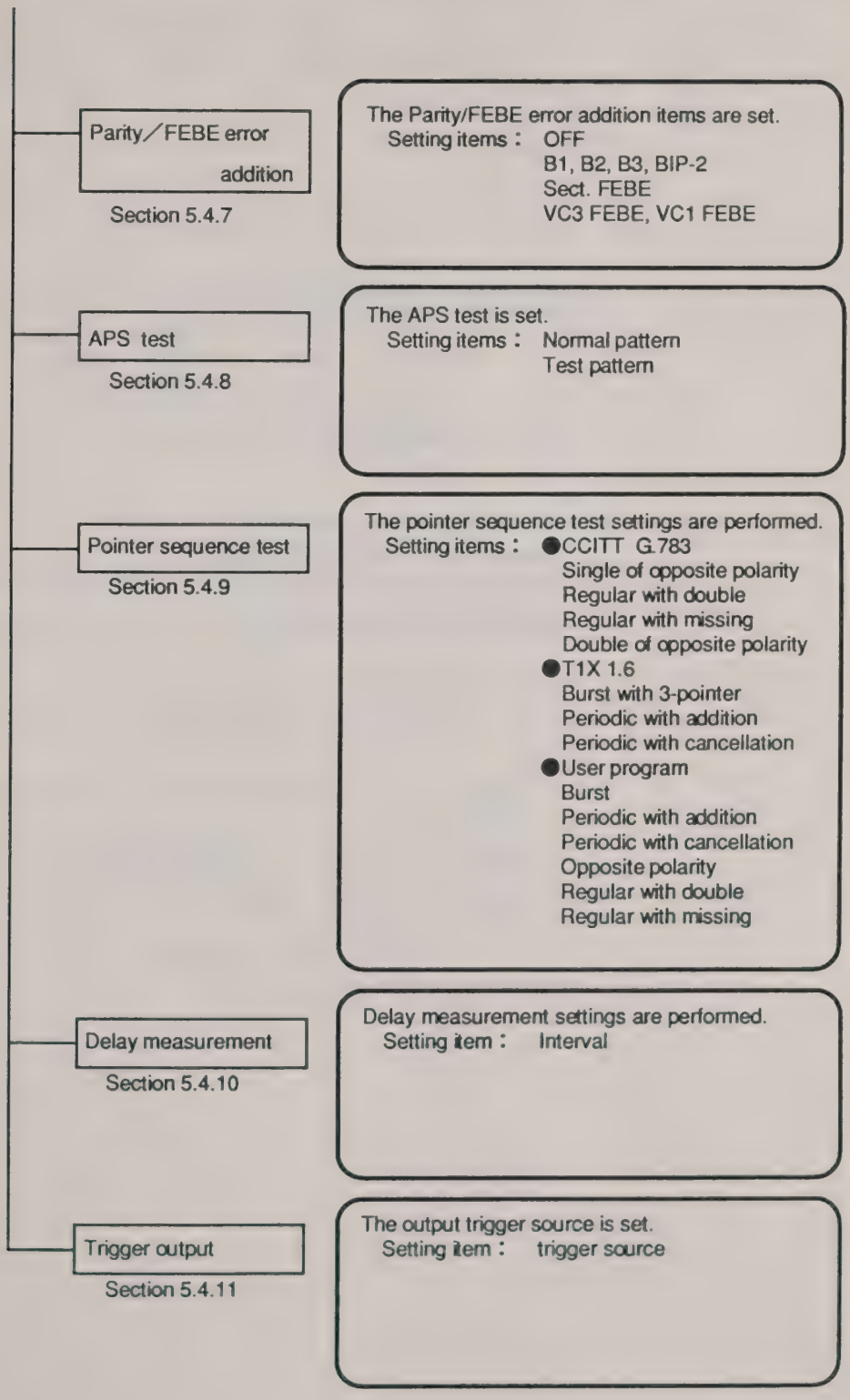
○ : Settable

5. 4 Setting SDH-Internal

5. 4. 1 List of functions

The internally-generated SDH format signal is output.
The SDH-Internal functions are listed below.


SDH-Internal
Generated pattern
Section 5.4.2
The test signal generated pattern is set.
Setting items : Bit rate
Type
Scramble
Route
Section 5.4.3
The test signal mapping route is set.
Setting items : Unit, Unit channel
Format
Route1, Route1 channel
Route2, Route2 channel
Signalling channel
Test pattern
Section 5.4.4
The test signal pattern is set.
Setting items : ●Payload
Information pattern
PRBS frame
0/1 consecutive pattern
Addition
Dummy R:Fixed stuff
Signalling pattern
C,C1/C2 bit justification
●OH
OH pattern
PTR, K1/K2
Addition
64-frame
Concatenation Indicator
●Frame
PRGM payload data
Alarm addition
Section 5.4.5
The alarm addition items are set.
Setting items : OFF
LOS, OOF, LOF
Section AIS/FERF
AU(TU) AIS/FERF/LOP
OH alarm, K1/K2
Frame shift
Signalling OOF/BAIS
Info. AIS, PDH OOF, H4 OOF
Bit error addition
Section 5.4.6
The bit error addition items are set.
Setting items : OFF
Bit all
Bit info.
Bit OH PRBS


Parity／FEBE error addition
Section 5.4.7
The Parity/FEBE error addition items are set.
Setting items： OFF
B1, B2, B3, BIP-2
Sect. FEBE
VC3 FEBE, VC1 FEBE
APS test
Section 5.4.8
The APS test is set.
Setting items： Normal pattern
Test pattern
Pointer sequence test
Section 5.4.9
The pointer sequence test settings are performed.
Setting items： ●CCITT G.783
Single of opposite polarity
Regular with double
Regular with missing
Double of opposite polarity
●T1X 1.6
Burst with 3-pointer
Periodic with addition
Periodic with cancellation
●User program
Burst
Periodic with addition
Periodic with cancellation
Opposite polarity
Regular with double
Regular with missing
Delay measurement
Section 5.4.10
Delay measurement settings are performed.
Setting item： Interval
Trigger output
Section 5.4.11
The output trigger source is set.
Setting item： trigger source

5. 4. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The settings can be performed on the following screen.

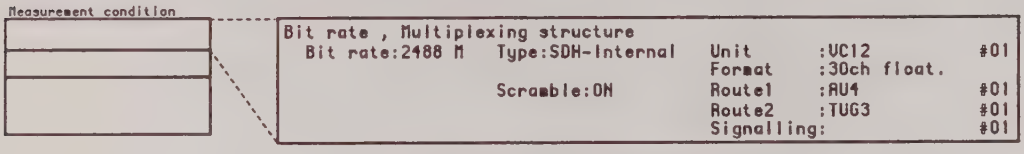


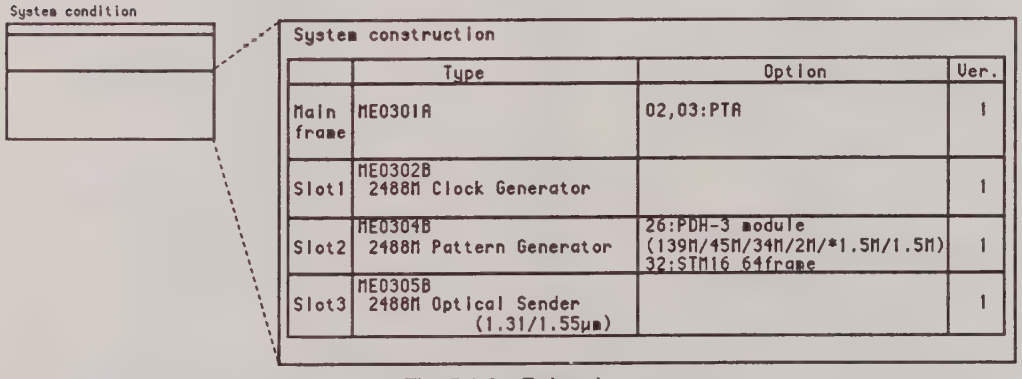
Fig. 5.4-1 Generated pattern setting screen

[Related items] The following items are affected.

Equipment name : ME3520A/ME3620A

Option condition : Presence/absence of Electrical option-25 or 26

However, the option condition can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302B 2488M Clock Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.4-2 Related screen

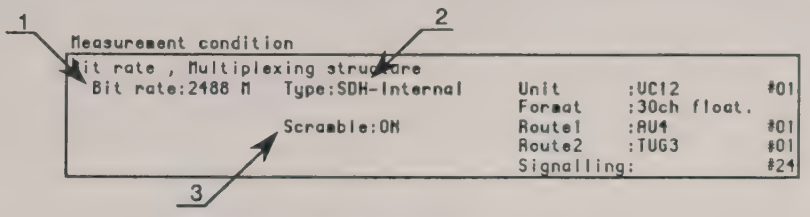


Fig. 5.4-3 Generated pattern settings

Bit rate

Sets the Bit rate of output signal at 1 .
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M is PDH settings. (→ See section 5.11)

Type

Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range] SDH-Internal

Scramble

Sets the Scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 4. 3 Setting route

The test signal mapping route is set here.

[Setting items]

The following items can be set.

- Unit and Unit channel
- Format
- Route1 and Route1 channel
- Route2 and Route2 channel
- Signalling channel

[Operation screen]

The setting can be performed on the following screen.

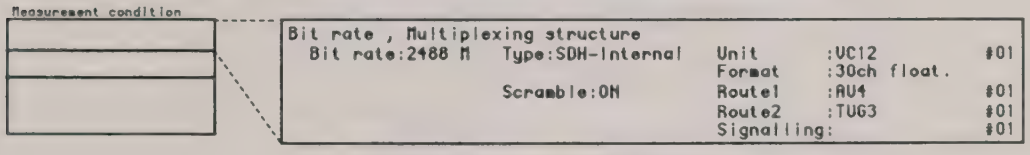


Fig. 5.4-4 Route setting screen

[Related items]

The settable mapping route can be conformed at the following screen.

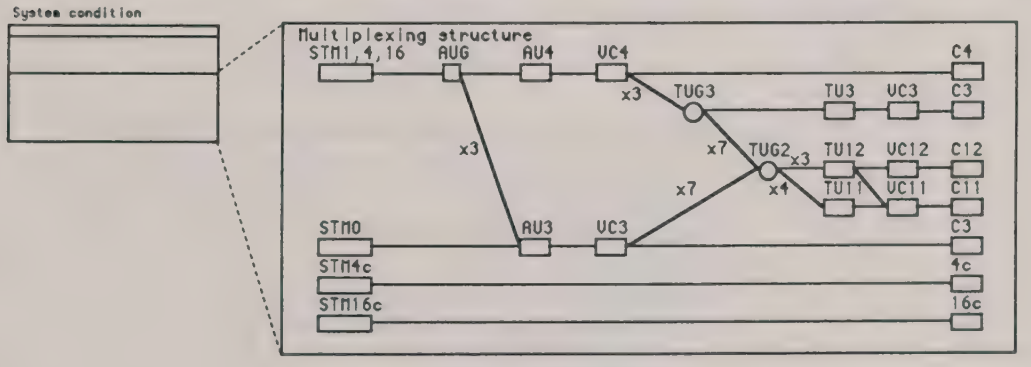


Fig. 5.4-5 Related screen

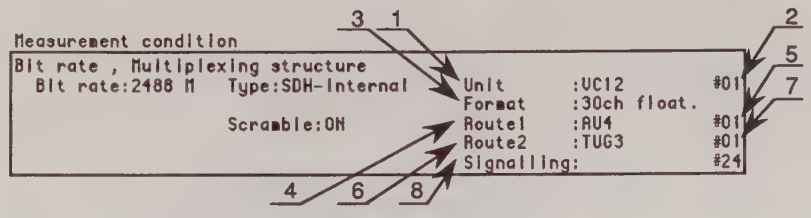


Fig. 5.4-6 Route settings

Unit Sets the Unit at 1.
The setting range is as follows:

[Setting range]
VC11
VC11(TU12)
VC12
VC3(TU3)
VC3
VC4
STM0 (52M)
STM1
VC4-4c
VC4-16c

Note:

1. VC11, VC11(TU12), VC12 and VC3(TU3) can be set when electrical option-25 or 26 is installed.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	VC11, VC11(TU12), VC12 VC3 STM0(52M)
156 M	VC11, VC11(TU12), VC12, VC3(TU3) VC3, VC4 STM0(52M), STM1
622 M	VC11, VC11(TU12), VC12, VC3(TU3) VC3, VC4, VC4-4c STM0(52M), STM1
2488 M	VC11, VC11(TU12), VC12, VC3(TU3) VC3, VC4, VC4-16c STM0(52M), STM1

3. Program data is stored in STM0 (52M) and STM1. For further details, refer to section 5.4.4 Test Pattern Settings ●PRGM payload data.

Unit Channel

Sets the Unit Channel at 2.
The setting range is as follows:

[Setting range] #01 ~ #48 / step 1

Note:

Setting range has following restrictions according to the Bit rate and the Unit 1 of generated pattern.

Unit	Setting range
VC11	#01 ~ #28
VC11(TU12) VC12	#01 ~ #21

Bit rate	Unit	Setting range
52 M	VC3 STM0(52M)	#01
156 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #03
	VC4 STM1	#01
622 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #12
	VC4 STM1	#01 ~ #04
	VC4-4c	#01
2488 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #48
	VC4 STM1	#01 ~ #16
	VC4-16c	#01

Format

Sets the Format of Unit at 3.
The setting range is as follows:

[Setting range]
Bulk
Async.
139M Async.
34M Async.
34M Bit sync.
Bit float.
Bit locked
Byte float.
Byte locked
30ch float.
30ch locked
31ch float.
31ch locked
PRGM

Note: Setting range has following restrictions according to the Unit 1.

Unit	Setting range
VC11 VC11(TU12)	Bulk Async. Bit float., Bit locked Byte float., Byte locked
VC12	Bulk Async. Bit float., Bit locked 30ch float., 30ch locked, 31ch float., 31ch locked
VC3(TU3)	Bulk 34 M Async. 34 M Bit sync.
VC4	Bulk 139 M Async.
STM0(52M) STM1	PRGM
Except above	Bulk

Route1 Sets the Route of AU at 4.
The setting range is as follows:

[Setting range] AU3
AU4

Note: Setting range has following restrictions according to the Bit rate and the Unit 1 of generated pattern.

Bit rate	Unit	Setting range
52 M	VC11 VC11(TU12) VC12	AU3
	Except above	Unsettable
156 M 622 M 2488 M	VC11 VC11(TU12) VC12	AU3, AU4
	VC3(TU3)	AU4
	Except above	Unsettable

Route1 Channel Sets the Route Channel of AU at 5.
The setting range is as follows:

[Setting range] #01 ~ #48 / step 1

Note:

1. Route1 Channel 5 can be set when the Route1 4 is settable.
2. Setting range has following restrictions according to the Bit rate and the Route1 4 of generated pattern.

Bit rate	Route 1	Setting range
156 M	AU3	#01 ~ #03
	AU4	#01
622 M	AU3	#01 ~ #12
	AU4	#01 ~ #04
2488 M	AU3	#01 ~ #48
	AU4	#01 ~ #16

Route2

Sets the TUG3 at 6.
The setting range is as follows:

[Setting range] TUG3

Note:

Route2 6 can be set when the Route1 4 is AU4 and Unit 1 is VC11, VC11(TU12), VC12 or VC3(TU3).

Route2 Channel

Sets the Route Channel of TUG3 at 7.
The setting range is as follows:

[Setting range] #01 ~ #03 / step 1

Note:

Route2 Channel 7 can be set when the Route2 6 is settable.

Signalling

Sets the Signalling Channel at 8.
The setting range is as follows.

[Setting range] #01 ~ #30 / step 1

Note:

Setting range has following restrictions according to the Format 3 .

Format	Setting range
30ch float. 30ch locked	#01 ~ #30
Byte float. Byte locked	#01 ~ #24
Except above	Unsettable

5. 4. 4 Setting test pattern

The test signal pattern is set here.

[Setting items] The following items can be set.

- Payload settings
  - Information pattern
  - PRBS frame
  - Dummy, R:Fixed stuff
  - Signalling pattern
  - 0/1 consecutive pattern
  - C, C1/C2 bit justification
- OH settings
  - SOH/POH Preset pattern
  - SOH/POH pattern SOH/POH
    PTR
    K1/K2
  - Concatenation indicator
- Frame settings
  - PRGM payload data

[Operation screen] The settings can be performed on the following screen.

- Payload settings

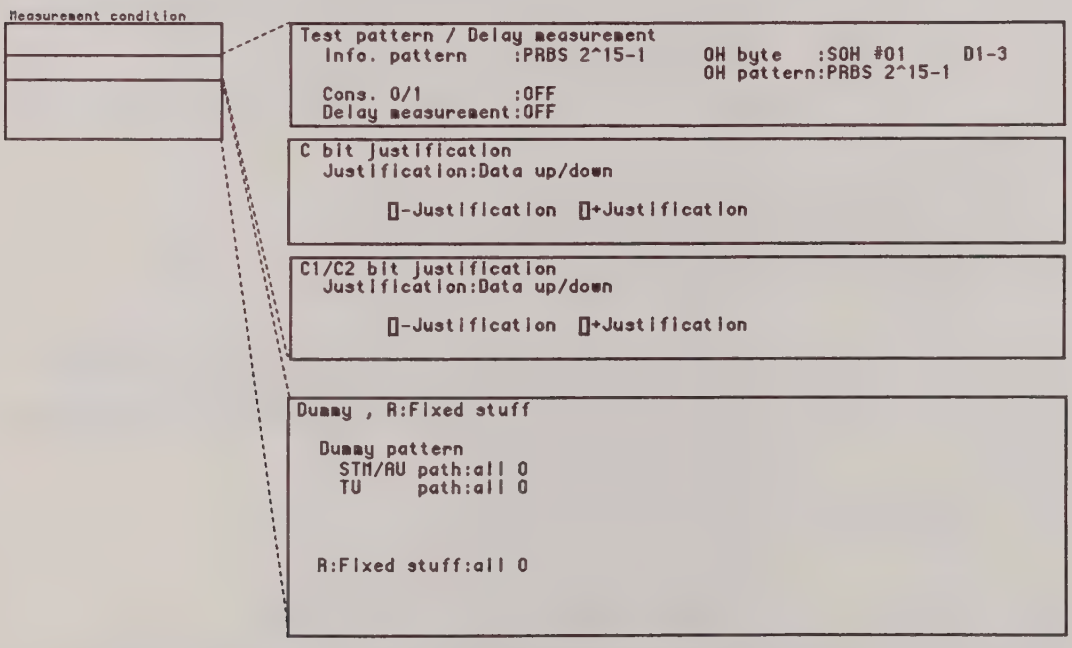


Fig. 5.4-7 Payload setting screen

● OH settings

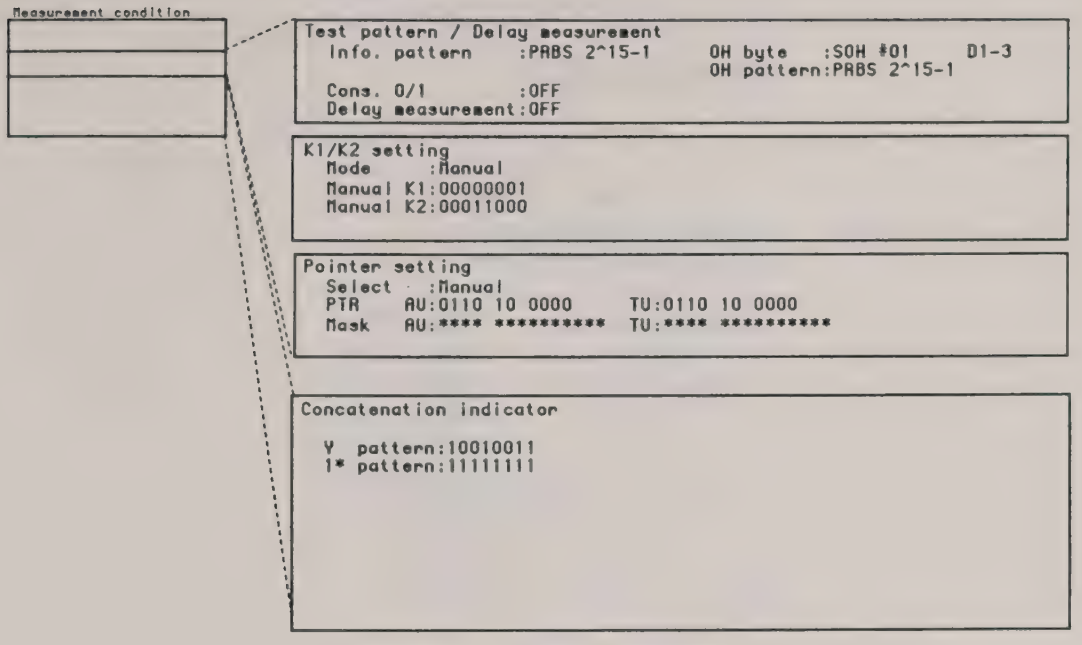


Fig. 5.4-8 OH settings screen

In addition, the following screens are available as pattern editing screens.

- PRGM SOH/POH preset data screen
- PRGM CRC-7 data screen
- PRGM SOH 64-frame data screen
- PRGM POH 64-byte data screen
- PRGM pointer 64-frame data screen

● Frame settings

PRGM payload data screen

[Related items] The following items are affected.

Generated pattern : Bit rate

Route setting : Unit, Format

● Information pattern／Frame

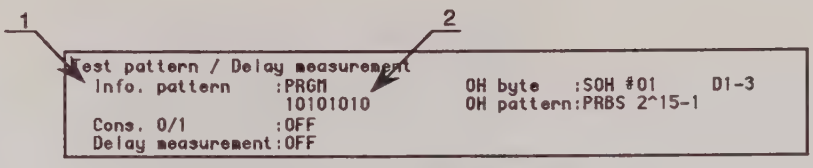


Fig. 5.4-9 Information pattern settings

Info. pattern — Sets the Information pattern at 1.
The setting range is as follows:

[Setting range]
- PRBS 2^9-1
- PRBS 2^11-1
- PRBS 2^15-1
- PRBS 2^20-1
- PRBS 2^20-1z
- PRBS 2^23-1
- PRGM
- all 0
- all 1
- Add

PRGM pattern — Sets any 8-bit arbitrary pattern at 2.
The setting range is as follows:

[Setting range] 00000000 ～ 11111111 ／bit-pattern setting

Note:

1. The setting range of Info. pattern 1 has following restrictions according to the Unit and the Format of Route setting.
2. PRGM pattern 2 can be set when the Info. pattern 1 is PRGM.

Unit	Format	Setting range									
		2^9-1	2^11-1	2^15-1	2^20-1	2^20-1z	2^23-1	PRGM	all 0 *	all 1 *	Add
VC11	Bulk	×	×	○	○	○	○	○	○	○	×
VC11(TU12)	Except above	×	×	○	○	○	○	○	○	○	○
VC12	Bulk	×	×	○	○	×	○	○	○	○	×
	Except above	×	×	○	○	×	○	○	○	○	○
VC3(TU3)	Bulk	×	×	○	○	×	○	○	○	○	×
	Except above	×	×	○	○	×	○	○	○	○	○
VC3	Bulk	○	○	○	○	×	○	○	○	○	×
VC4	Bulk	○	○	○	○	×	○	○	○	○	×
	Except above	×	×	○	×	×	○	×	○	○	○
VC4-4c	Bulk	○	○	○	○	×	○	○	○	○	×
VC4-16c	Bulk	○	○	○	○	×	○	○	○	○	×
Except above	PRGM	Unsettable									

* : This cannot be set when PRBS frame is Framed ○ : Settable

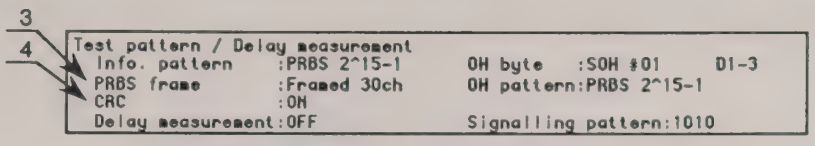


Fig. 5.4-10 PRBS frame settings

PRBS frame

Sets the PRBS frame at 3.
The setting range is as follows:

[Setting range]
- Unframed
- Framed 30ch
- Framed 31ch
- Framed SF
- Framed ESF

CRC

Sets the CRC addition of PRBS frame at 4.
The setting range is as follows:

[Setting range]
- OFF : Not add
- ON : Add

Note:

1. The setting range of PRBS frame 3 has following restrictions according to the Format of Route setting.

Unit	Format	Setting range				
		Unframed	30ch	31ch	SF	ESF
VC11	Bulk	Unsettable				
VC11(TU12)	Except above	○	×	×	○	○
VC12	30ch float. 30ch locked	○	○	×	×	×
	31ch float. 31ch locked	○	×	○	×	×
	Except above	Unsettable				
Except above	(Don't care)					

○ : Settable

2. CRC 4 can be set when the PRBS frame 3 is Framed 30ch.

● Dummy／Stuff pattern

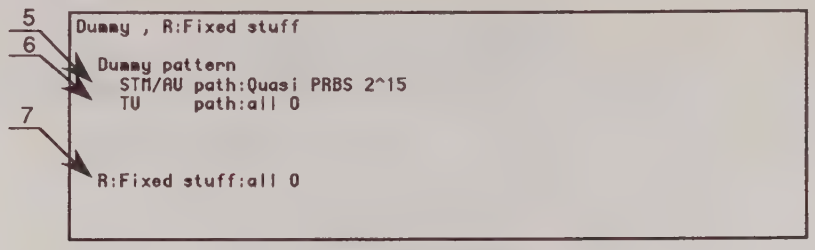


Fig. 5.4-11 Dummy/Stuff settings

STM／AU path — Sets the channel pattern of except Unit channel in STM／AU path at 5.
The setting range is as follows:

[Setting range] all 0
all 1
Quasi PRBS 2^15

TU path — Sets the channel pattern of except Unit channel in TU path at 6.
The setting range is as follows:

[Setting range] all 0
all 1

Note: TU path can be set when electrical option-25 or 26 is mounted.

R : Stuff — Sets the Stuff bit pattern inserted into payload at 7.
The setting range is as follows:

[Setting range] all 0
all 1

● Signalling

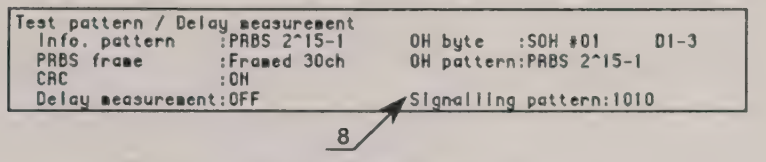


Fig. 5.4-12 Signalling pattern settings

Signalling pattern — Sets the Signalling bit pattern at 8.
The setting range is as follows:

[Setting range] 0000 ~ 1111 / bit-pattern setting

Note: Signalling pattern 8 has following restrictions according to the Unit, the Form at of Route setting and the Info. pattern 1 .

Unit	Format	Info. pattern	Signalling
VC11 VC11(TU12)	Byte float.	(Don't care)	○
	Byte locked		○
	Except above		×
VC12	30ch float.	Except Add	○
	30ch locked		○
	Except above		×
Except above	(Don't care)		×

○ : Settable

● 0／1 Consecutive pattern

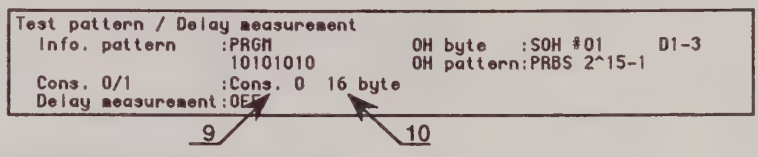


Fig. 5.4-13 Cons. 0/1 settings

Type — Sets the type of 0／1 Consecutive pattern at 9.
The setting range is as follows:

[Setting range] OFF
Cons. 0
Cons. 1

Byte No. — Sets the insert byte No. at 10.
The setting range is as follows:

[Setting range] 1 ～ 100 ／ step 1

Note:

1. Type 9 can be set when the Delay measurement is OFF.
2. Byte No. 10 can be set when the Type 9 is Cons. 0 or Cons. 1.
3. Byte No. 10 has following restrictions according to the Bit rate of generated pattern and the Unit, the Unit-CH, the Format of Route setting.

Bit rate	Unit	Format	Unit-CH	Byte No.	Step No.
52 M	VC3	Bulk	#01	1 ～ 87	1
	Except above			Unsettable	
156 M 622 M 2488 M	VC3	Bulk	#01	1 ～ 100	1
	VC4				1
	VC4-4c				*1
	VC4-16c				**1
	Except above			Unsettable	

* : 4 bytes when Info. pttern is PRBS

** : 16 bytes when Info. pttern is PRBS

● C, C1/C2 bit justification

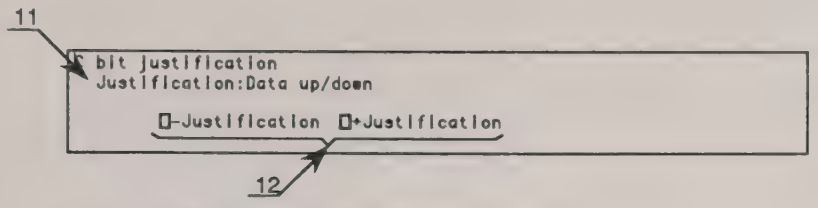


Fig. 5.4-14 C bit justification settings

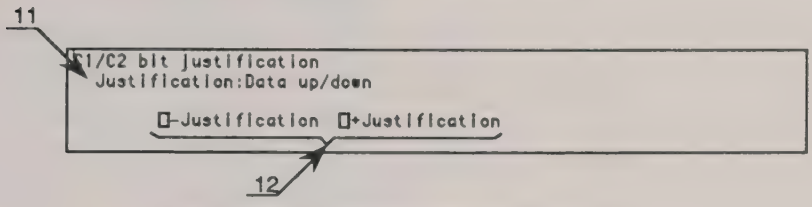


Fig. 5.4-15 C1/C2 bit justification settings

Justification — Sets the Justification at 11.
The setting range is as follows:

[Setting method] — Cursor sets on the Data up/down, operates Step key(up/down) or Rotary encoder.
When Step up key pressed or Rotary encoder turn to right, +justification is generated, and when Step down key pressed or Rotary encoder turn to left, -justification is generated.

+Justification
-Justification — Monitors practice status at 12.
The display format is as follows:

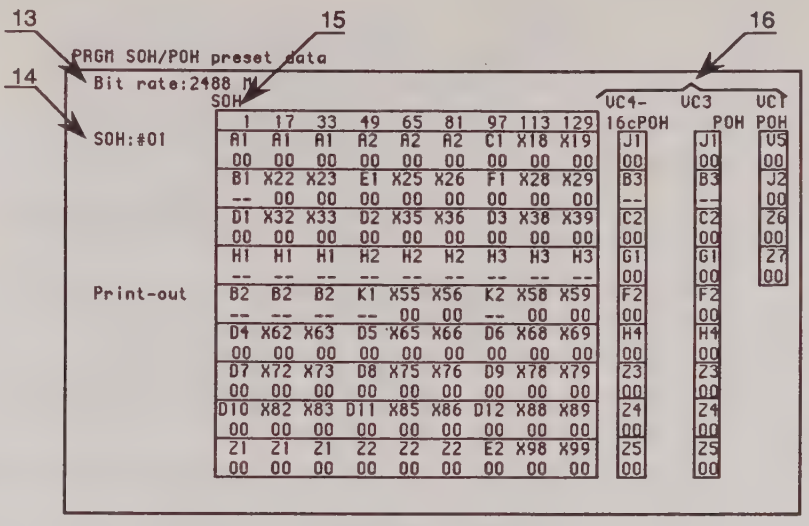
[Display format]

☐ Justification not practice (Normal display)
■ Justification practice (Reverse display)

Note: C,C1/C2 bit justification can be set under the following condition.

Item	Unit	Format	Info. pattern
C	VC4	139 M Async.	Except Add
C1/C2	VC11 VC11(TU12) VC12	Async.	
	VC3(TU3)	34 M Async.	

● SOH/POH preset pattern



SOH 1	17	33	49	65	81	97	113	129	VC4-16cPOH	VC3 POH	VC1 POH
A1	A1	A1	A2	A2	A2	C1	X18	X19	J1	J1	V5
00	00	00	00	00	00	00	00	00	00	00	00
B1	X22	X23	E1	X25	X26	F1	X28	X29	B3	B3	J2
--	00	00	00	00	00	00	00	00	--	--	00
D1	X32	X33	D2	X35	X36	D3	X38	X39	C2	C2	Z6
00	00	00	00	00	00	00	00	00	00	00	00
H1	H1	H1	H2	H2	H2	H3	H3	H3	G1	G1	Z7
--	--	--	--	--	--	--	--	--	00	00	00
B2	B2	B2	K1	X55	X56	K2	X58	X59	F2	F2	
--	--	--	--	00	00	--	00	00	00	00	
D4	X62	X63	D5	X65	X66	D6	X68	X69	H4	H4	
00	00	00	00	00	00	00	00	00	00	00	
D7	X72	X73	D8	X75	X76	D9	X78	X79	Z3	Z3	
00	00	00	00	00	00	00	00	00	00	00	
D10	X82	X83	D11	X85	X86	D12	X88	X89	Z4	Z4	
00	00	00	00	00	00	00	00	00	00	00	
Z1	Z1	Z1	Z2	Z2	Z2	E2	X98	X99	Z5	Z5	
00	00	00	00	00	00	00	00	00	00	00	

Fig. 5.4-16 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 13.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488M can be set only ME3620A.
2. The pattern setting is possible for arbitrary Bit rate, but the output data with the same Bit rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 14.
The setting range is as follows:

[Setting range] #01 ~ # 16 / step 1

Note: Setting range has following restrictions according to the Bit rate 13.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH pattern

Sets the SOH preset pattern at 15.
The setting range is as follows:

[Setting range] All bytes except K1/K2, H1/H2/H3, B1 and B2

POH pattern

Sets the POH preset pattern at 16.
The setting range is as follows:

[Setting range]

◆VC4, VC4-4c, VC4-16c
All bytes except B3
◆VC3
All bytes except B3
◆VC1
V5, J2, Z6, Z7

Note:

1. VC1 POH can be set when electrical option-25 or 26 is installed.
2. VC4 POH label is changed as follows according to the Bit rate 13.

Bit rate	POH label
52 M	Not display
156 M	VC4 POH
622 M	VC4-4c POH
2488 M	VC4-16c POH

＜Restriction item＞

1. Output POH pattern is as follows according to the Bit rate of generated pattern and the Route setting.

Bit rate	Unit	Route1	POH output pattern		
			VC4	VC3	VC1
52 M	VC11 VC11(TU12) VC12	(Don't care)	×	○	○
	Except above		×	○	×
156 M 622 M 2488 M	VC11 VC11(TU12) VC12	AU3	×	○	○
		AU4	○	×	○
	VC3(TU3)	(Don't care)	○	○	×
	VC3 STM0(52 M)		×	○	×
	Except above		○	×	×

○ : Outputable

2. Multi-frame H4 byte setting has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	H4 setting range
VC11 VC11(TU12)	Bulk Async. Bit float.	1 ～ 6 bit
	Bit locked	All bit possible
	Byte float.	1 ～ 6 bit
	Byte locked	5, 6, 7 bit
VC12	Bulk Async. Bit float.	1 ～ 6 bit
	Bit locked	All bit possible
	30ch float. 31ch float.	1 ～ 6 bit
	30ch locked 30ch locked	1 ～ 6 bit

Except bits are set for hardware automatically.

3. V5 BIP-2 cannot be set. (Set automatically by hardware)

● SOH/POH pattern

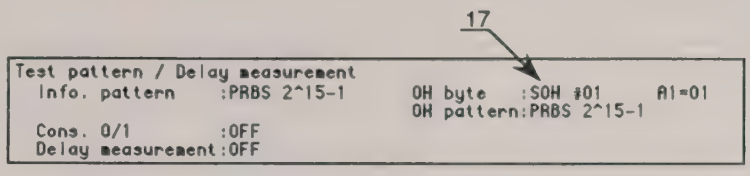


Fig. 5.4-17 SOH/POH pattern setting

Type Sets the type of OH performed pattern setting at 17.
The setting range is as follows:

[Setting range] OFF
SOH
POH

Note:

1. POH cannot be set when the Format of Route setting is PRGM.
2. At OFF, the pattern setting is not performed to OH byte. In this case, outputs the SOH/POH preset pattern.

◆SOH(except K1/K2, PTR)

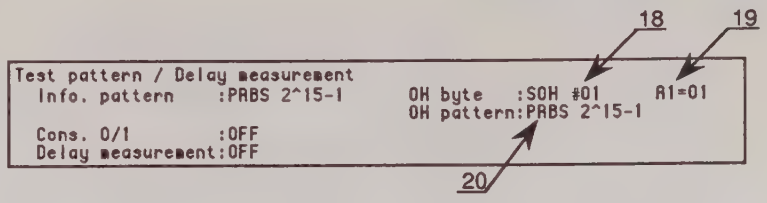


Fig. 5.4-18 SOH(except K1/K2, PTR) pattern settings

SOH #No. Sets the SOH No. performed pattern setting at 18.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note:
1. SOH #No. 18 can be set when the Type 17 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

SOH byte Sets the SOH byte performed pattern setting at 19.
The setting range is as follows:

[Setting range] 1 byte : All bytes except K1/K2, H1/H2/H3, B1 and B2
DCC(1-3) : 3 bytes of D1～D3
DCC(4-12) : 9 bytes of D4～D12

Note:
1. SOH byte 19 can be set when the Type 17 is SOH.
2. DCC(1-3) and DCC(4-12) can be set when the SOH #No. 18 is #01.

OH pattern

Sets the insert pattern to SOH at 20.
The setting range is as follows:

[Setting range]

Bit meas. OFF	: Pattern not insert
PRBS 2^11-1	: Inserts PRBS pattern
PRBS 2^15-1	: Inserts PRBS pattern
PRGM 64-frame	: Inserts SOH 64-frame pattern
External	: Inserts external pattern

Note:

1. At Bit meas. OFF, the SOH/POH preset pattern is outputted.
2. External cannot be set at Tracking ON. (Tracking setting sees section 5.17.4)
3. PRGM 64-frame can be set when the mapping is as follows.

Bit rate	Unit	Format
52 M	VC3	Bulk
156 M	VC4	
622 M	VC4-4c	
2488 M	VC4-16c	

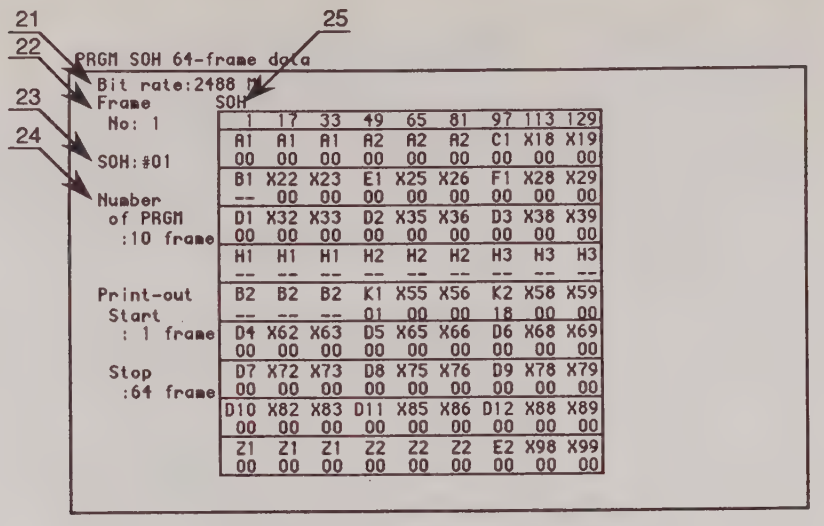


Fig. 5.4-19 PRGM 64-frame pattern settings

Bit rate — Sets the Bit rate performed pattern editing at 21.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note: 2488M can be set only ME3620A.

Frame No. — Sets the frame No. performed editing at 22.
The setting range is as follows:

[setting range] 1 ~ 64 / step 1

SOH #No.

Sets the SOH No. performed editing at 23.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note: Setting range has following restrictions according to the Bit rate 21.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

Number of PRGM

Sets the output frame No. at 24.
The setting range is as follows:

[Setting range] 1 ~ 64 / step 1

SOH

Sets the SOH pattern at 25.
The setting range is as follows:

[Setting range] All bytes except H1/H2/H3, B1 and B2

Note: PRGM 64-frame pattern is effective when the OH pattern 20 is PRGM 64-frame, and outputs the pattern of Bit rate 21 same as the Bit rate of generated pattern.

◆K1/K2

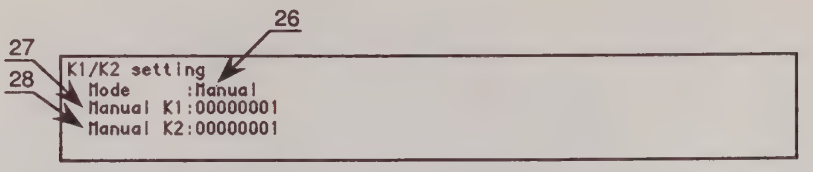


Fig. 5.4-20 K1/K2 pattern settings

Mode Sets the K1/K2 setting mode at 26.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting
External : External pattern inserting
APS test : Automatic Protection Switching

Note:
1. External cannot be set when the OH pattern 20 is External.
2. APS test sees section 5.4.8 APS test.

Manual K1
Manual K2 Sets the K1/K2 arbitrary pattern at 27, 28.
The setting range is as follows:

[Setting range] 00000000 ～ 11111111 ／bit-pattern setting

Note: Pattern 27 and 28 can be set when the Mode 26 is Manual.

◆Pointer

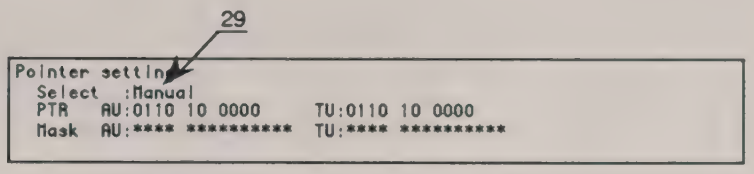


Fig. 5.4-21 Pointer pattern settings

Select Sets the pointer setting mode at 29.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting
PRGM 64-frame : Consecutive setting
PTR seq. test : Pointer sequence test

Note:

1. Pointer pattern cannot be set when the Cons. 0/1 9 is except OFF or the Format of Route setting is PRGM.
2. Manual and PRGM 64-frame have following restrictions.

Unit	Format	Info. pattern	Manual		PRGM 64-frame	
			AU	TU	AU	TU
VC11 VC11(TU12) VC12	Bulk	(Don't care)	○	○	○	○
	Async.	Except Add	○	○	○	○
		Add	○	○	○	×
	float.	Except Add	○	○	○	○
		Add	○	×	○	×
	locked	(Don't care)	○	×	○	×
VC3(TU3)	Bulk	(Don't care)	○	○	○	○
	except above	Except Add	○	○	○	○
		Add	○	○	○	×
VC3 VC4 VC4-4c VC4-16c	(Don't care)		○	×	○	×

○ : Settable

3. PTR seq. test sees section 5.4.9 Pointer sequence test.

Fig. 5.4-22 Manual settings

PTR Sets the AU pointer or TU pointer pattern at 30.
The setting range and setting method are as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings
PTR : 0 ~ 1023 / step 1

[Setting method] Cursor sets on the pointer pattern 30, setting is possible by 2 types of method as follows.
(1) Setting using NDF
Open the window, sets pointer value.
(2) Setting using Justification
When Step up key pressed or Rotary encoder turn to the right, +justification is generated, and when Step down key pressed or Rotary encoder turn to the left, -justification is generated.

Mask Sets Mask bit at 31.
The setting range is as follows:

[Setting range] NDF : **** ~ MMMM * : Not Mask
ID : ********** M : Mask
~ MMMMMMMMMM

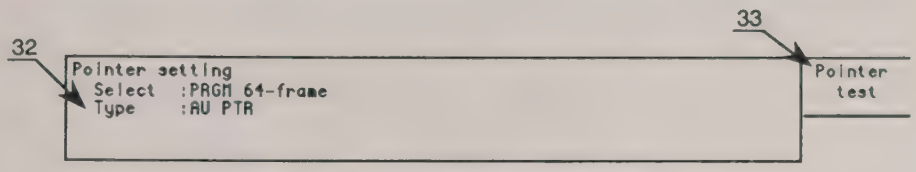


Fig. 5.4-23 PRGM 64-frame settings

Type — Sets the type of pointer performed 64-frame setting at 32.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Pointer test — Sets the output control using function key at 33.
The setting range is as follows:

[Setting range] Pointer test OFF : Does not set pattern
Pointer test ON : Set pattern

Note: In the case of Pointer test ON, data set 'PRGM pointer 64-frame data' is outputted, but in the case of Pointer test OFF, data set Manual 30, 31 is outputted.

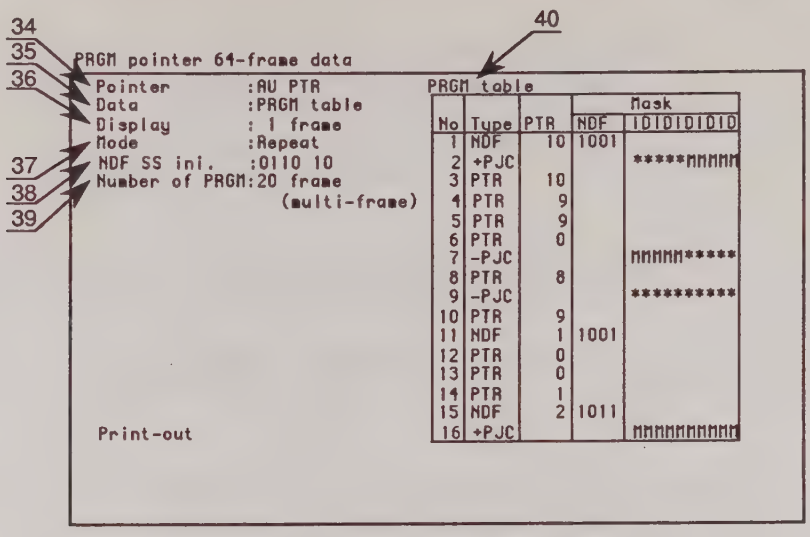


Fig. 5.4-24 PRGM 64-frame pattern settings

Pointer

Sets the type of pointer performed pattern setting at 34.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Note: TU PTR can be set when electrical option-25 or 26 is installed.

Number of PRGM

Sets the output frame No. at 39.
The setting range is as follows:

[Setting range] 2 ~ 64 / step 1

Note: When the Pointer 34 is AU PTR and the Mode 37 is Single, 64 cannot be set.

NDF SS ini.

Sets the initial value of NDF and SS at 38.
The setting range is as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings

Mode

Sets the action mode at 37.
The setting range is as follows:

[Setting range] Single
Repeat

PRGM table

Sets the PRGM pattern of pointer at 40.
The setting range is as follows:

[Setting range] When Type is NDF,
PTR : 0 ~ 1023 / step 1
NDF : 0000 ~ 1111 / bit-pattern settings
When Type is PTR,
PTR : 0 ~ 1023 / step 1
When Type is +PJC or -PJC,
ID : ＊＊＊＊＊＊＊＊＊＊ ~
MMMMMMMMMM
＊ : Not Mask
M : Mask

Note:

There are following restrictions in the pattern setting:

- No.1 can be set only NDF.
- The repeat point can be set only PTR.
- +PJC and -PJC cannot be set the consecutive setting.
- When the just before PTR value is out of following value, +PJC and -PJC cannot be set.

Pointer	Unit	Pointer Range
AU	(Don't care)	0 ~ 782
TU	VC11	0 ~ 103
	VC11(TU12) VC12	0 ~ 139
	VC3(TU3)	0 ~ 764

Data

Sets the switch of display data at 35.
The setting range is as follows:

[Setting range]

PRGM table	: Setting value
Memory	: Setting value is spread to output pattern

Note:

The Memory has following features:

- ■ indicates that the reverse of ID bit is masked in +PJC/-PJC.
- Succeeding data to frame No. of 'Number of PRGM 39' cannot be displayed.

PRGM table

No	Type	PTR	Mask NDF	Mask ID1ID1ID1ID1
1	NDF	10	1001	
2	+PJC			****MMMM
3	PTR	10		
4	PTR	9		
5	PTR	9		
6	PTR	0		
7	-PJC			MMMM****
8	PTR	8		
9	-PJC			**********
10	PTR	9		
11	NDF	1	1001	
12	PTR	0		
13	PTR	0		
14	PTR	1		
15	NDF	2	1011	
16	+PJC			MMMMMMMMM

Memory

No	Output NDF	Output SS	Output ID1ID1ID1ID1	Internal J1	
1	1001	10	0000001010	10	NDF
2	0110	10	1010 C1C1C		+PJC
3	0110	10	0000001010	11	
4	0110	10	0000001001	9	PTR
5	0110	10	0000001001	9	PTR
6	0110	10	0000000000	0	PTR
7	0110	10	C0C0C10101		-PJC
8	0110	10	0000001000	782	
9	0110	10	0110100100		+PJC
10	0110	10	0000001001	0	
11	1001	10	0000000001	1	NDF
12	0110	10	0000000000	0	PTR
13	0110	10	0000000000	0	PTR
14	0110	10	0000000001	1	PTR
15	1011	10	0000000010	2	NDF
16	0110	10	C000000010		+PJC

Fig. 5.4-25 Data displayings

Display

Sets the head position of data display at 36.
The setting range is as follows:

[Setting range] 1 ~ 49 / step 1

Note:

When the Pointer 34 is AU PTR and the Mode 37 is Single, 49 cannot be set.

◆POH

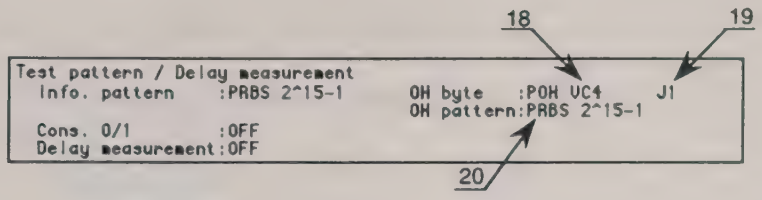


Fig. 5.4-26 POH settings

POH type

Sets the type of POH performed pattern setting at 18.
The setting range is as follows:

[Setting range]
VC4-16c
VC4-4c
VC4
VC3
VC1

Note:

1. POH type 18 can be set when the Type 17 is POH.
2. Setting range has following restrictions according to the Route setting.

Unit	Format	Route1	Setting range
VC11 VC11(TU12) VC12	Except locked	AU3	VC3, VC1
		AU4	VC4,VC1
	locked	AU3	VC3
		AU4	VC4
VC3(TU3)	(Don't care)		VC4, VC3
VC3			VC3
VC4			VC4
VC4-4c			VC4-4c
VC4-16c			VC4-16c
Except above			Unsettable

POH byte

Sets the POH byte performed pattern setting at 19.
The setting range is as follows:

[Setting range]
◆VC3, VC4, VC4-4c, VC4-16c
All bytes except B3
◆VC1
V5, J2, Z6, Z7

Note:

1. POH byte 19 can be set when the Type 17 is POH.
2. J1 byte can be set when the Cons. 0/1 9 is OFF.

OH pattern

Sets the POH pattern at 20.
The setting range is as follows:

[Setting range]

Bit meas. OFF	: Not insert pattern
PRBS 2^11-1	: Inserts PRBS pattern
PRBS 2^15-1	: Inserts PRBS pattern
PRGM 64-byte	: Inserts POH 64-frame pattern
External	: Inserts external pattern
PRGM CRC-7	: Inserts CRC pattern

Note:

1. At Bit meas. OFF, the SOH/POH preset pattern is outputted.
2. External cannot be set at Tracking ON. (Tracking setting sees section 5.17.4)
3. Setting range has following restrictions according to the POH type 18 and the POH byte 19.

POH type	POH byte	Setting range				
		OFF	PRBS	External	64-byte	CRC-7
VC1	J2	○	×	×	○	○
	Except above	○	×	×	○	×
VC3 VC4	J1	○	○	○	○	*○
	H4	○	**○	○	**○	×
	Except above	○	○	○	○	×
VC4-4c VC4-16c	(Don't care)	○	○	○	○	×

* : Settable when Route setting Format is except Bulk

** : Settable when Route setting Format is except Bit locked

3. At PRGM 64-byte, V5 BIP-2 cannot be set.

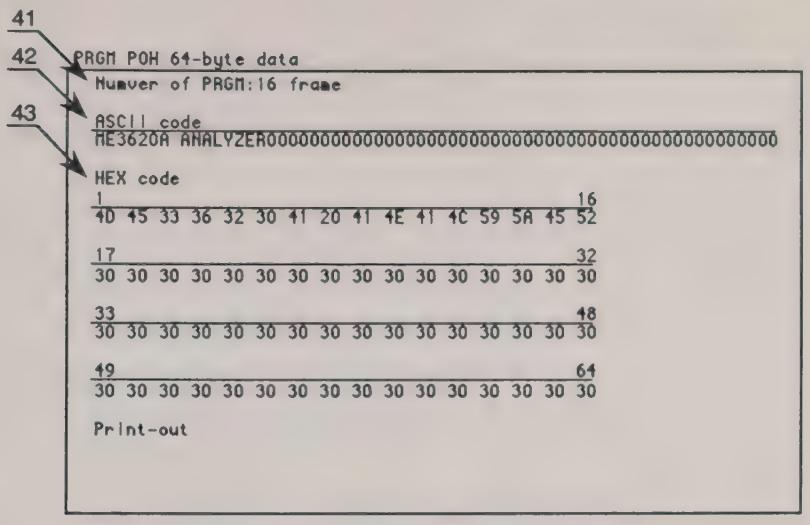


Fig. 5.4-27 PRGM 64-byte pattern settings

Number of PRGM Sets the output frame No. at 41.
The setting range is as follows:

[Setting range] 2 ~ 64 / step 1

ASCII code Sets the POH pattern (ASCII code) at 42.
The setting range is as follows:

[Setting range] 00 ~ FF by ASCII code

HEX code Sets the POH pattern (HEX code) at 43.
The setting range is as follows:

[Setting range] 00 ~ FF / step 1

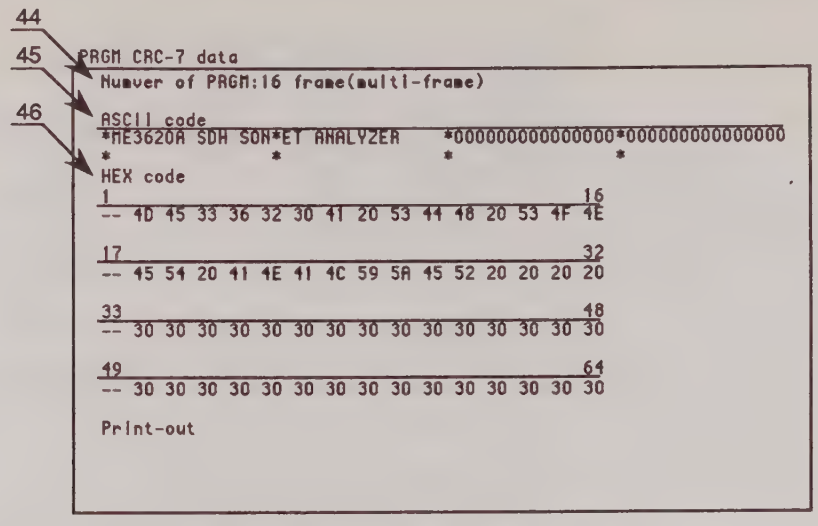


Fig. 5.4-28 PRGM CRC-7 pattern settings

Number of PRGM Sets the output frame No. at 44.
The setting range is as follows:

[Setting range] 16 ~ 64 / step 16

ASCII code Sets the POH pattern (ASCII code) at 45.
The setting range is as follows:

[Setting range] 00 ~ 7F by ASCII code

HEX code Sets the POH pattern (HEX code) at 46.
The setting range is as follows:

[Setting range] 00 ~ 7F / step 1

Note: Byte No. 1, 17, 33 and 49 cannot be set.

● Concatenation Indicator

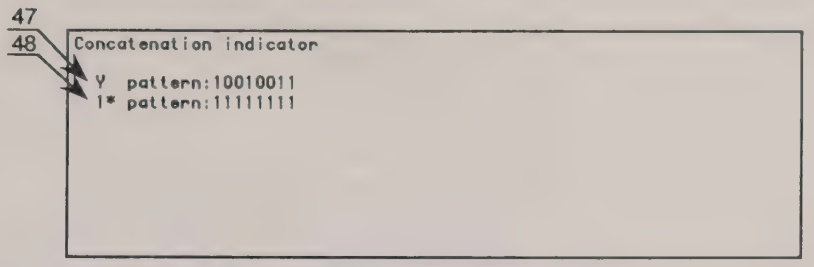


Fig. 5.4-29 Concatenation pattern settings

Y pattern Sets the Y byte in AU pointer at 47.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

1 * pattern Sets the 1 * byte in AU pointer at 48.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

● PRGM payload data

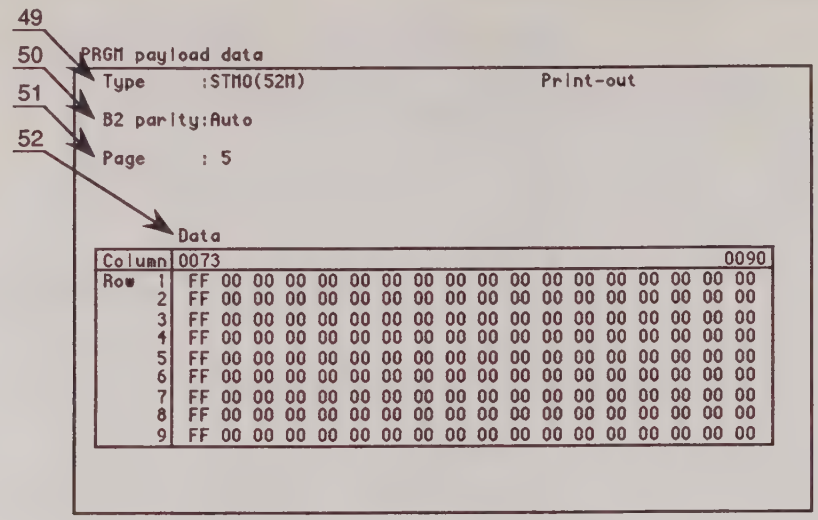


Fig. 5.4-30 PRGM payload data pattern settings

Type Sets the frame size performed pattern setting at 49.
The setting range is as follows:

[Setting range] STM0 (52M) : 9 x 90 bytes
STM1 : 9 x 270 bytes

B2 parity Sets the B2 calculation method at 50.
The setting range is as follows:

[Setting range] Auto : Calculate automatically and output
PRGM : Output set pattern in B2

Page Sets the pattern display position at 51.
The setting range is as follows:

[Setting range] 1 ~ 15 / step 1

Note: Setting range has following restrictions according to the Type 49.

Type	Setting range
STM0(52M)	1 ~ 5
STM1	1 ~ 15

Data — Sets the pattern at 52.
The setting range is as follows:

[Setting range] 00 ~ FF / step 1

Note: The setting data is effective when the Route setting Format is PRGM.

5. 4. 5 Alarm addition

The alarm addition items are set here.

[Setting items] The following items can be set.

OFF		
LOS	:	Loss Of Signal
OOF	:	Out Of Frame
LOF	:	Loss Of Frame
Sect. AIS	:	Section Alarm Indication Signal
Sect. FERF	:	Section Far End Receive Failure
AU AIS	:	AU Alarm Indication Signal
AU LOP	:	AU Loss Of Pointer
AU FERF	:	AU Far End Receive Failure
TU AIS	:	TU Alarm Indication Signal
TU LOP	:	TU Loss Of Pointer
TU FERF	:	TU Far End Receive Failure
H4 OOF	:	H4 Out Of Frame
PDH OOF	:	PDH Out Of Frame
Info. AIS	:	Information Alarm Indication Signal
Signalling OOF	:	Signalling Out Of Frame
Signalling BAIS	:	Signalling Backward Alarm Indication signal
OH alarm		
K1/K2		
Frame shift		
Alarm add		

[Operation screen] The settings can be performed on the following screen.

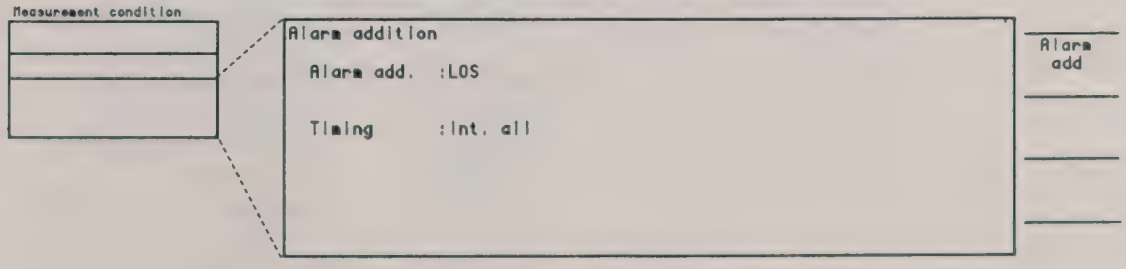


Fig. 5.4-31 Alarm addition screen

Note:

1. When the function key 'Alarm add' is OFF, the set alarm item is not enabled.
2. Alarm addition is not performed at the APS test execution condition or the Delay measurement execution condition.

[Related items] The following items are affected.

Route setting	:	Unit, Format
Test pattern	:	Information pattern/Frame

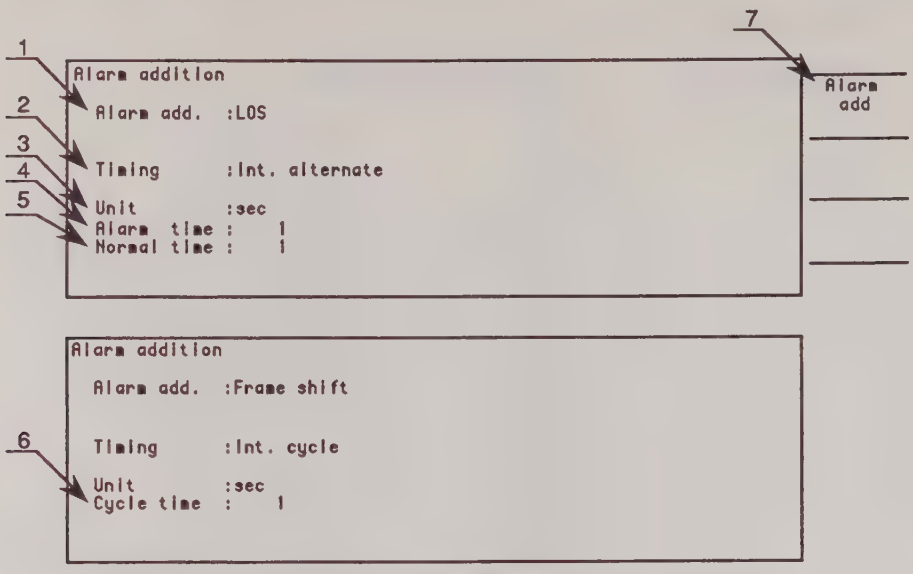


Fig. 5.4-32 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not alarm addition
LOS	: Sets output signal interrupt
OOF	: Frame sync loss
LOF	: Frame sync loss
Sect. AIS	: All bits except SOH 1 to 3 row set to all 1s
Sect. FERF	: K2 b6～b8 set to '110'
AU AIS	: AU level set to all 1s
AU LOP	: AU PTR set to out of range
AU FERF	: G1 b5 set to '1'
TU AIS	: All bit set to all 1 containing TU PTR
TU LOP	: TU PTR set to out of range
TU FERF	: V5 b8 set to '1'
H4 OOF	: H4 bit is reversed
PDH OOF	: Frame error
Info. AIS	: Information set to all 1s
Signalling OOF	: Signalling bit is reversed
Signalling BAIS	: b6(Y bit)of time slot 17 of frame(F0) containing Multi-frame signal set to '1'
OH alarm	: Alarm pattern set to arbitrary byte in OH
K1/K2	: Alarm pattern set to K1/K2
Frame shift	: 1 bit shift

Setting range of Alarm add. 1 has following restrictions according to the Unit and the Format of the Route setting.

Unit	Format	Setting range												
		OFF	LOS	OOF	LOF	Sect. AIS	Sect. FERF	AU AIS	AU LOP	AU FERF	OH alarm		K1/K2	Fram shift
											SOH	POH		
STM0(52M) STM1	PRGM	○	○	○	○	○	○	×	×	×	×	×	×	×
Except above	(Don't care)	○	○	○	○	○	○	○	○	○	○	○	○	○

○ : Settable

Unit	Format	Setting range									
		TU AIS	TU LOP	TU FERF	H4 OOF	PDH OOF	Info. AIS	Sig. OOF	Sig. BAIS	OH alarm (POH)	
										TU3	VC1
VC11 VC11(TU12)	Bulk	○	○	○	○	×	×	×	×	×	○
	Async.	○	○	○	○	○	○	×	×	×	○
	Bit float.	○	○	○	○	○	○	×	×	×	○
	Bit locked	○	×	×	×	○	○	×	×	×	×
	Byte float.	○	○	○	○	○	○	○	×	×	○
	Byte locked	○	×	×	×	○	○	○	×	×	×
VC12	Bulk	○	○	○	○	×	×	×	×	×	○
	Async.	○	○	○	○	○	○	×	×	×	○
	Bit float.	○	○	○	○	○	○	×	×	×	○
	Bit locked	○	×	×	×	○	○	×	×	×	×
	30ch float.	○	○	○	○	○	○	○	○	×	○
	30ch locked	○	×	×	×	○	○	○	○	×	×
	31ch float.	○	○	○	○	○	○	×	×	×	○
	31ch locked	○	×	×	×	○	○	×	×	×	×
VC3(TU3)	Bulk	○	○	○	×	×	×	×	×	○	○
	34M Async.	○	○	○	×	×	○	×	×	○	○
	34M Bit Sync.	○	○	○	×	×	○	×	×	○	○
Except above	(Don't care)	×	×	×	×	×	×	×	×	×	×

Timing

Sets the addition timing at 2.
The setting range is as follows:

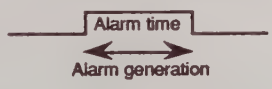
[Setting range]
- Int. single
- Int. cycle
- Int. all
- Int. alternate
- Ext. gate

■Control signal

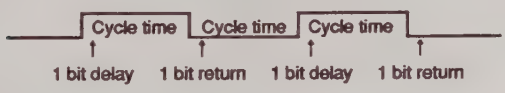
Int. single

Frame shift

Except above

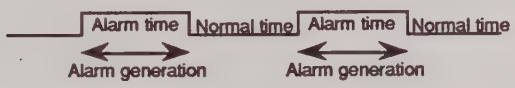


Int. cycle



Int. all — Adds every frame

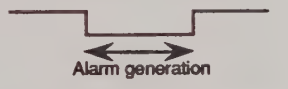
Int. alternate



Ext. gate — Adds according to the Input signal from Control Input Alarm/Trigger connector

Frame shift

Except above



Note: Setting range has following restrictions according to the Alarm add. 1.

Alarm add.	Setting range				
	Int. single	Int. cycle	Int. all	Int. alternate	Ext. gate
Frame shift	○	○	×	×	○
Info. AIS PDH OOF	×	×	○	×	×
Except above	○	×	○	○	○

○ : Settable

Unit

Sets the Unit of addition time at 3.
The setting range is as follows:

[Setting range]
- Frame
- μsec
- msec
- sec

Note:

1. Unit 3 can be set when the Timing 2 is Int. single or Int. alternate.
2. Setting range has restriction according to the Alarm add. 1. (see following table)

Alarm time

Sets the alarm addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time

Sets the alarm not addition time at 5.
The setting range is as follows:

[Setting range] See following table

Cycle time

Sets the execution time of Frame shift at 6.
The setting range is as follows:

[Setting range] See following table

Alarm add.	Alarm time / Normal time / Cycle time setting range			
	Frame	μsec	msec	sec
LOS	Unsettable	5 ~ 99875 /5	1 ~ 8000 /1	1 ~ 8 /1
OOF	1 ~ 23 /1	125 ~ 2875 /125	1 ~ 2 /2	Unsettable
LOF	24 ~ 40000 /1	Unsettable	3 ~ 8000 /1	1 ~ 8 /1
Sect. AIS	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Sect. FERF				
AU AIS				
AU LOP				
AU FERF				
TU AIS	4 ~ 40000 /4	500 ~ 99500 /500	1 ~ 8000 /1	
TU LOP				
TU FERF				
H4 OOF				
Sig. OOF	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Sig. BAIS	16 ~ 40000 /16	2000 ~ 98000 /2000	2 ~ 8000 /2	
OH alarm	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
K1/K2				
Frame shift				

Alarm add

Controls the execution of Alarm addition by using 'Alarm add' function key at 5.
The setting range is as follows:

[Setting range] Alarm add OFF : Does no add alarm
Alarm add ON : Adds alarm

Note:

1. The Alarm add 7 is disable when the Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with Timing 2. In addition, the LED of alarm items being set light in sequence on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' function key label is released from the reverse-display and the alarm is not added. The LED of the set alarm item go off on the front panel alarm section.

● OOF/LOF

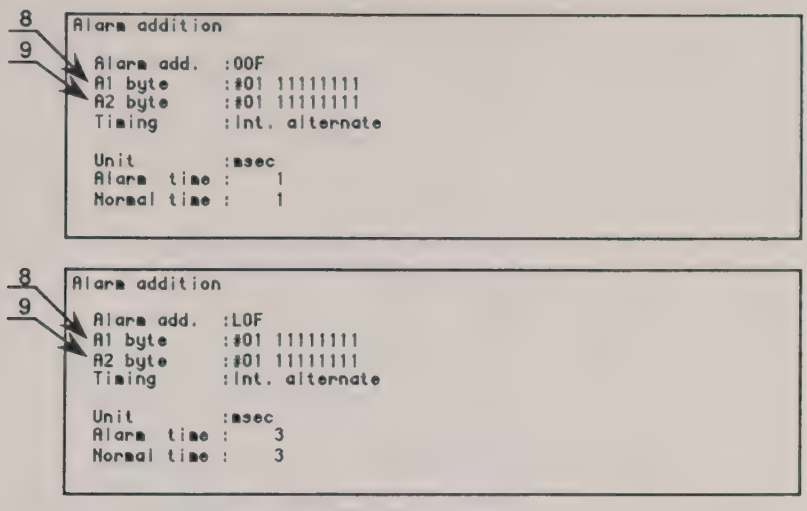


Fig. 5.4-33 OOF/LOF settings

A1 byte
A2 byte

Sets the byte position and alarm pattern of A1/A2 byte at 8 , 9.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ~ #48 / step 1
◆Pattern
00000000 ~ 11111111
/ bit-pattern settings

Note: Setting range of byte position has following restrictions accrding to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01 ~ #03
622 M	#01 ~ #12
2488 M	#01 ~ #48

● AU LOP/TU LOP

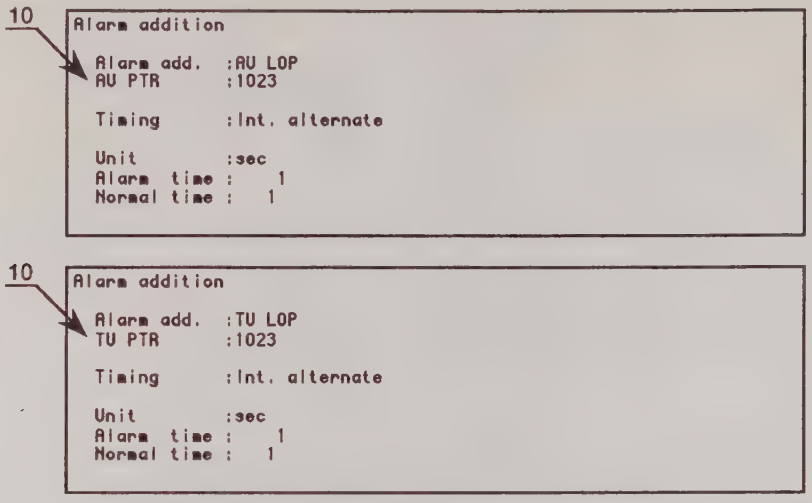


Fig. 5.4-34 AU LOP/TU LOP settings

AU PTR
TU PTR

Sets the alarm pattern of pointer at 10.
The setting range is as follows:

[Setting range] 104 ~ 1023 / step 1

Note: Setting range has following restrictions according to the Unit of Route setting.

PTR	Unit	Setting range
TU	VC11	104 ~ 1023
	VC11(TU12)	140 ~ 1023
	VC12	
	VC3(TU3)	765 ~ 1023
AU	(Don't care)	783 ~ 1023

● H4 OOF

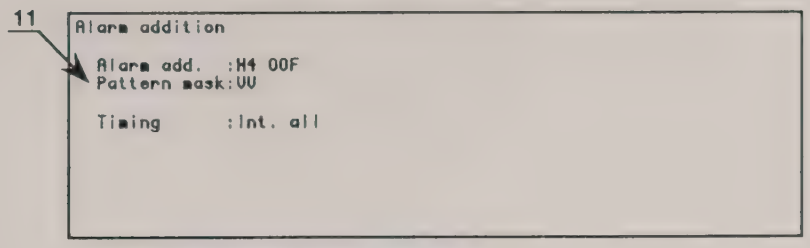


Fig. 5.4-35 H4 OOF settings

Pattern mask — Sets the alarm pattern of H4 bit at 11.
The setting range is as follows:

[Setting range] ＊＊ ～ VV ／ ＊ : Not reverse
V : Reverse

● Signalling OOF

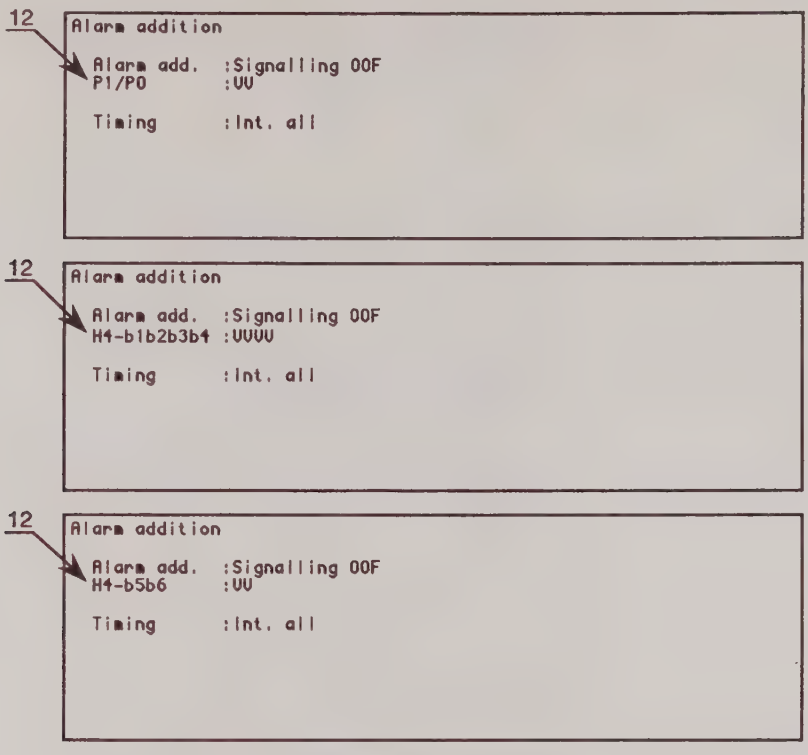


Fig. 5.4-36 Signalling OOF settings

P1/P0
H4-b1b2b3b4
H4-b5b6

Sets the alarm pattern of Signalling bit at 12.
The setting range is as follows:

[Setting range] ◆P1/P0,H4-b5b6
＊＊ ～ VV ／ ＊ : Not reverse
V : Reverse

◆H4-b1b2b3b4
＊＊＊＊ ～ VVVV ／ ＊ : Not reverse
V : Reverse

Note: Setting range has following restrictions according to the Format of Route setting.

Format	Setting range		
	P1/P0	b1b2b3b4	b5b6
30ch float.	○	×	×
30ch locked	×	×	○
Byte float.	○	×	×
Byte locked	×	○	×
Except above	Unsettable		

○ : Settable

● OH alarm

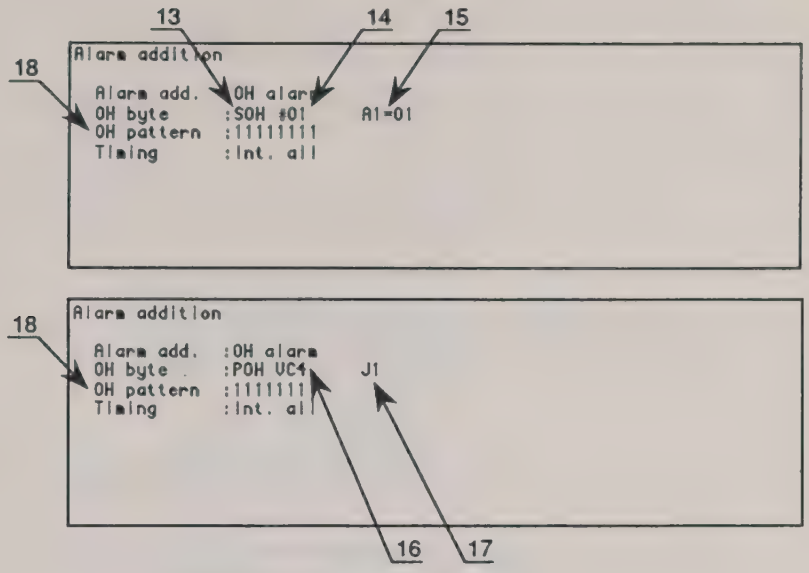


Fig. 5.4-37 OH alarm settings

Type Sets the kind of OH performed alarm addition at 13.
The setting range is as follows:

[Setting range] SOH
POH

Note: POH cannot be set when the Format of Route setting is PRGM.

SOH #No. Sets the SOH No. performed alarm addition at 14.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note:
1. SOH #No. 14 can be set when Type 13 is SOH.
2. Setting range has following restrictions according to the Bit rate of Route setting.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH byte Sets the SOH byte performed alarm addition at 15.
The setting range is as follows:

[Setting range] Arbitrary 1 byte except K1/K2, H1/H2/H3, B1 and B2

Note: SOH byte 15 can be set when the Type 13 is SOH.

POH type Sets the kind of POH performed alarm addition at 16.
The setting range is as follows:

[Setting range] VC4-16c
VC4-4c
VC4
VC3
VC1

Note:
1. POH type 16 can be set when the Type 13 is POH.
2. Setting range has following restrictions according to the Unit of Route setting.

Unit	Format	Route1	Setting range
VC11 VC11(TU12) VC12	Except locked	AU3	VC3, VC1
		AU4	VC4,VC1
	locked	AU3	VC3
		AU4	VC4
VC3(TU3)	(Don't care)		VC4, VC3
VC3			VC3
VC4			VC4
VC4-4c			VC4-4c
VC4-16c			VC4-16c
Except above			Unsettable

POH byte

Sets the POH byte performed alarm addition at 17.
The setting range is as follows:

[Setting range]
◆VC3, VC4, VC4-4c, VC4-16c
Arbitrary 1 byte except B3
◆VC1
V5, J2, Z6, Z7

Note:

1. POH byte 17 can be set when the the Type 13 is POH.
2. J1 byte can be set when the Cons. 0/1 of test pattern is OFF.

OH pattern

Sets the alarm pattern at 18.
The setting range is as follows:

[Setting range] ◆Except V5
00000000 ~ 11111111 ／bit-pattern settings
◆V5
**000000 ~ **111111 ／bit-pattern settings

Note:

Upper 2 bits of V5(BIP-2) cannot be set.

● K1/K2

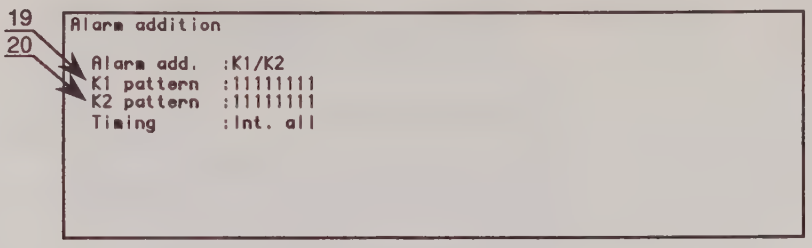


Fig. 5.4-38 K1/K2 settings

K1 pattern
K2 pattern

Sets the alarm pattern at 19, 20.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 ／bit-pattern settings

5. 4. 6 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF		
All areas	:	Bit all
Information area	:	Bit info.
PRBS pattern inserted in OH	:	Bit OH PRBS

Bit error add

[Operation screen] The settings can be performed on the following screen.

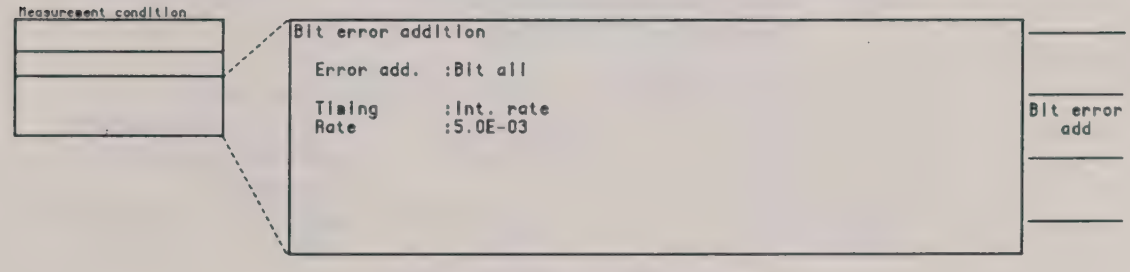


Fig. 5.4-39 Bit error addition screen

Note:

1. The set error item is not enabled when the 'Bit error add' function key is disabled.
2. Bit error addition cannot be performed at the Delay measurement execution condition.

[Related items] The following items are affected.

Route setting	:	Unit
Test pattern	:	Information pattern／Frame, OHpattern

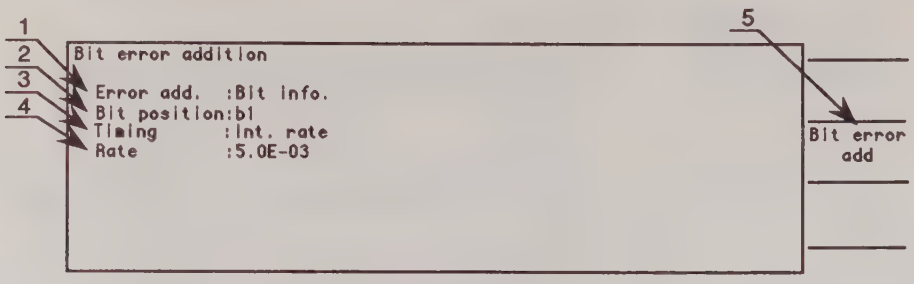


Fig. 5.4-40 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
Bit all	: Adds error all areas of signal
Bit info.	: Adds arbitrary 1 bit error in Information area
Bit OH PRBS	: Adds error PRBS area inserted in OH

Note: Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range			
	OFF	Bit all	Bit info.	Bit OH PRBS
VC11 VC11(TU12) VC12 VC3(TU3)	○	×	○	×
VC3 VC4 VC4-4c VC4-16c	○	○	○	*○
STM0(52M) STM1	○	○	×	*○

○ : Settable

* : Setting cannot be performed when the OH type of test pattern is OFF or OH pattern is except PRBS.

Bit position

Sets the Bit position added error at 2.
The setting range is as follows:

[Setting range] b1 ~ b8 / Arbitrary 1 bit

Note: Bit position 2 can be set when the Error add. 1 is Bit info.. But it cannot be set the Format of Route setting is 139M Async..

Timing

Sets the addition timing at 3.
The setting range is as follows:

[Setting range]
- Int. single : Adds 1 bit error when 'Bit error add' key 5 pressed
- Int. rate : Adds error according to error rate
- Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate

Sets the added error rate at 4.
The setting range is as follows:

[Setting range]
5.0E-03
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
1.0E-09
1.0E-10

Note: Rate 4 can be set when the Timing 3 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 5.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 5 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 3. In addition, the LED of error item being added (Bit or OH bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 4. 7 Parity／FEBE error addition

The Parity／FEBE error addition items are set here.

[Setting items] The following items can be set.

OFF
Parity B1
B2
B3
BIP-2
FEBE Sect. FEBE : Section Far End Block Error
B3 FEBE
VC1 FEBE

Parity/FEBE error add

[Operation screen] The settings can be performed on the following screen.

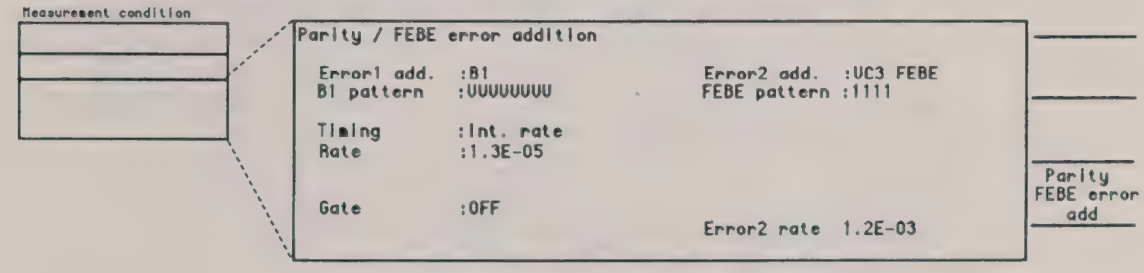


Fig. 5.4-41 Parity／FEBE error addition screen

Note:

1. The types of error: Error1 and Error2 can be set simultaneously but the Error2 addition timing is performed at the Error1 set timing.
2. The set error items are not enabled when the 'Parity/FEBE error add' function key is disabled.
3. Parity/FEBE error addition cannot be performed at the Delay measurement execution condition.

[Related items] The following items are affected.

Generated pattern : Bit rate
Route setting : Unit, Format

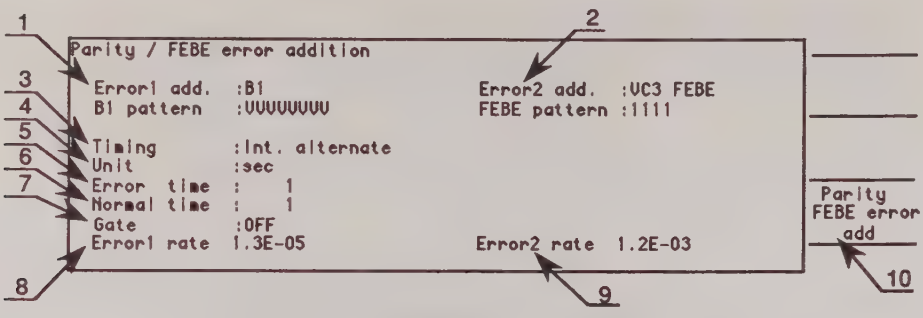


Fig. 5.4-42 Parity/FEBE error settings

Error1 add.
Error2 add.

Sets the error items at 1 and 2.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
B1	: Adds error arbitrary bit in B1
B2	: Adds error arbitrary bit in B2
B3	: Adds error arbitrary bit in B3
BIP-2	: Adds BIP-2 error
Sect. FEBE	: Sets pattern to Z2 b2～b8
B3 FEBE	: Sets pattern to G1 b1～b4
VC1 FEBE	: Sets pattern to V5 b3

Note:

1. The error addition cannot be performed when the Error1 add. 1 is OFF.
2. The same item cannot be set at the Error1 add. 1 and the Error2 add. 2 except at OFF.
3. When the Error1 add. 1 (Error2 add. 2) is set BIP-2 (VC1 FEBE), the Error2 add. 2 (Error1 add. 1) can be set only VC1 FEBE (BIP-2).
4. Setting range of Error1 add. 1 and Error2 add. 2 has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Setting range							
		OFF	B1	B2	B3	BIP-2	Sect. FEBE	B3 FEBE	VC1 FEBE
VC11	locked	○	○	○	○	×	×	○	×
VC11(TU12) VC12	Except above	○	○	○	○	○	×	○	○
VC3(TU3)	(Don't care)	○	○	○	○	×	×	○	×
VC3 VC4 VC4-4c		○	○	○	○	×	*○	○	×
VC4-16c		○	○	○	○	×	×	○	×
STM0(52M) STM1		○	○	○	×	×	×	×	×

*: This can be set only when the Format of Route setting is Bulk ○ : Settable

Timing

Sets the addition timing at 3.
The setting range is as follows:

[Setting range]

Int. single
Int. all
Int. rate
Int. alternate
Ext. single

■Control signal

Int. single — When Parity/FEBE error add 10 is OFF→ON, adds 1 frame.

Int. all — While Parity/FEBE error add 10 is ON, adds every frame.

Int. rate — WhileParity/FEBE error add 10 is ON, adds used to error rate.

Int. alternate

Ext. single — While Parity/FEBE error add 10 is ON, adds 1 frame at falling edge of input signal from Control Input Error connector

Note:

1. Int. rate cannot be set when the Error1 add. 1 is VC1 FEBE.
2. The addition timing of Error2 add. 2 is same as the Error1 add. 1.

Unit

Sets the Unit of addition time at 4.
The setting range is as follows:

[Setting range]

Frame
μsec
msec
sec

Note:

Unit 4 can be set when the Timing 3 is Int. alternate.

Error time

Sets the error addition time at 5.
The setting range is as follows:

[Setting range] See following table

Normal time

Sets the error not addition time at 6.
The setting range is as follows:

[Setting range] See following table

Unit	Error time/Normal time setting range			
	Frame	μsec	msec	sec
VC11 VC11(TU12) VC12	4 ~ 40000 /4	500 ~ 99500 /500	1 ~ 8000 /1	1 ~8 /1
Except above	1 ~ 40000 /1	125 ~ 99875 /125		

Note: Error time 5 and Normal time 6 can be set when the Timing 3 is Int. alternate.

Gate

Sets the error control according to external signal at 7.
The setting range is as follows:

[Setting range] OFF : Does not external control
External : Adds error while the input signal from Control Input Error connector is Low level.

■Control signal
External

Note: Gate 7 can be set when the Timing 3 is Int. all, Int. rate or Int. alternate.

Error1 rate

Sets the added rate at 8.
The setting range is as follows:

[Setting range] 1.5E-12 ~ 4.0E-02

Note:

1. Error1 rate 8 is displayed when the Error1 add. 1 is except VC1 FEBE and the Timing 3 is Int. alternate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error item. (see table 5.4-1)

Error2 rate

Sets the added rate at 9.
The setting range is as follows:

[Setting range] 1.5E-12 ~ 4.0E-02

Note:

1. Error2 rate 9 is displayed when the Timing 3 is Int. alternate or Int. rate. But, it is not displayed when the Error2 add. 2 is VC1 FEBE.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error item. (see table 5.4-1)

Parity/FEBE error add

Controls the execution of Parity/FEBE error addition by using the 'Parity/FEBE error add' function key at 10.
The setting range is as follows:

[Setting range] Parity/FEBE error add OFF : Does not add
Parity/FEBE error add ON : Adds error

Note:

1. The Parity/FEBE error add 10 is disable when the Error add. 1 is OFF.
2. When the Parity/FEBE error add is ON, The 'Parity/FEBE error add' function key label is reverse-displayed and the error items being set are added in accordance with the Timing 3. In addition, the LEDs of Parity/FEBE error items being added light on the front panel error section.
3. When the Parity/FEBE error add is OFF, the 'Parity/FEBE error add' function key label is released from the reverse-display and the error is not added. In addition, the LEDs of Parity/FEBE error items being added go off on the front panel error section.

● B1

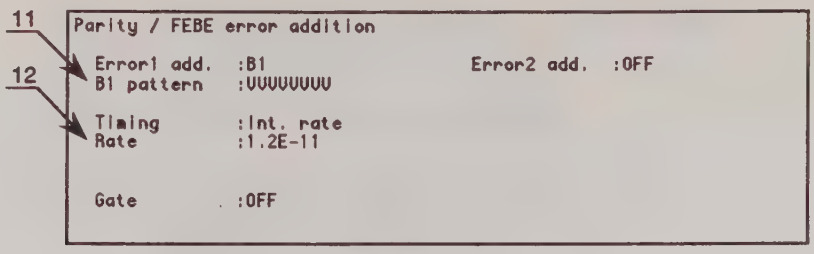


Fig. 5.4-43 B1 settings

B1 pattern — Sets the added pattern at 11.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ V V V V V V V V
＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 12.
The setting range is as follows:

[Setting range] 1.5E-12 ～ 6.2E-04

Note:

1. Rate 12 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B1 pattern 11. (see table 5.4-1)

● B2

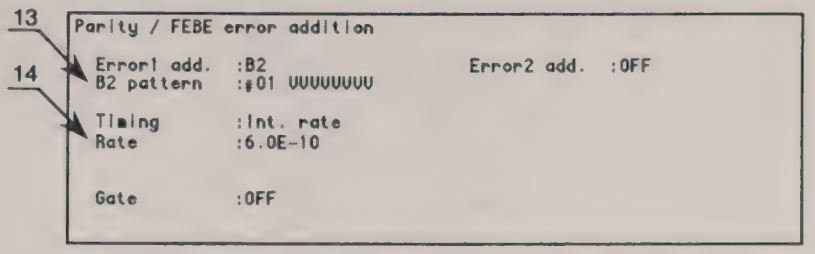


Fig. 5.4-44 B2 settings

B2 pattern

Sets the byte position and added pattern at 13.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ～ #48 ／ step 1
◆Pattern
＊＊＊＊＊＊＊＊ ～ V V V V V V V V
＊ : Does not add
V : Adds pattern

Note: Setting range has following restrictions according to the Bit rate of generation pattern.

Bit rate	Setting range	
	Byte position	Pattern
52 M	#01	Total 8 bits ＊／V
156 M	#01 ～ #03	Total 24 bits ＊／V
622 M	#01 ～ #12	Total 96 bits ＊／V
2488 M	#01 ～ #48	Total 348 bits ＊／V

Rate

Sets the added rate at 14.
The setting range is as follows:

[Setting range] 1.6E-12 ～ 6.2E-04

Note:
1. Rate 14 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B2 pattern 13. (see table 5.4-1)

● B3

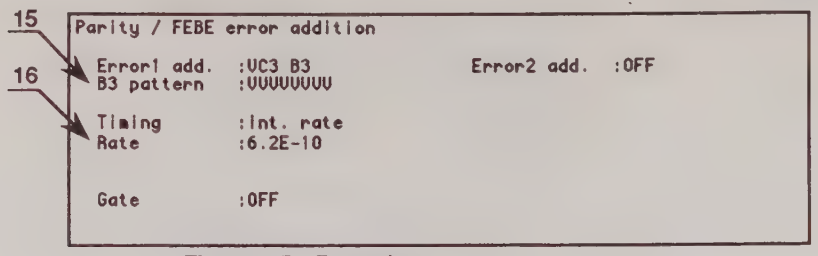


Fig. 5.4-45 B3 settings

B3 pattern — Sets the added pattern at 15.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ VVVVVVVV

＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 16.
The setting range is as follows:

[Setting range] 1.6E-12 ～ 8.5E-04

Note:

1. Rate 16 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the B3 pattern 15. (see table 5.4-1)

● BIP-2

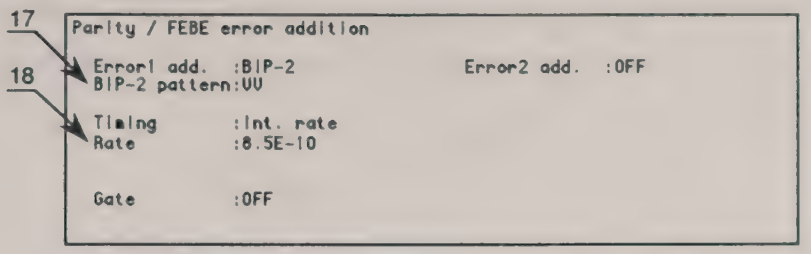


Fig. 5.4-46 BIP-2 settings

BIP-2 pattern Sets the added pattern at 17.
The setting range is as follows:

[Setting range] ＊＊ ～ V V ＊ : Does not add
V : Adds pattern

Rate Sets the added rate at 18.
The setting range is as follows:

[Setting range] 4.3E-10 ～ 3.0E-04

Note:

1. Rate 18 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the BIP-2 pattern 17. (see table 5.4-1)

● Section FEBE

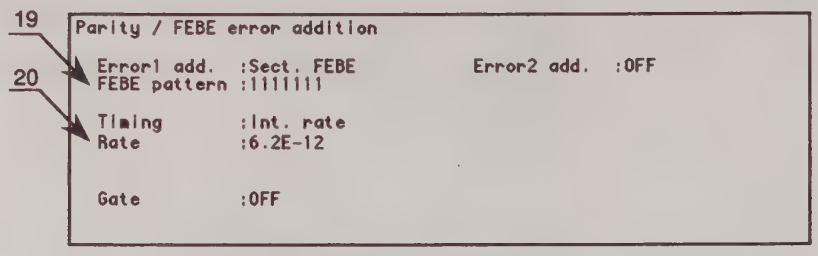


Fig. 5.4-47 Section FEBE settings

FEBE pattern Sets the added pattern at 19.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

Rate Sets the added rate at 20.
The setting range is as follows:

[Setting range] 6.2E-12 ~ 9.9E-03

Note:

1. Rate 20 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the FEBE pattern 19. (see table 5.4-1)

● B3 FEBE

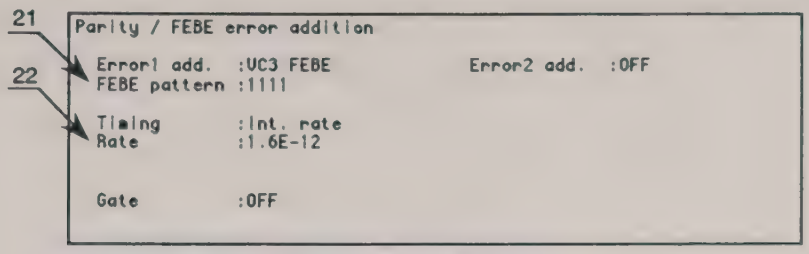


Fig. 5.4-48 B3 FEBE settings

FEBE pattern — Sets the added pattern at 21.
The setting range is as follows:

[Setting range] 0000 ~ 1111 ／ bit-pattern settings

Rate — Sets the added rate at 22.
The setting range is as follows:

[Setting range] 1.6E-12 ~ 1.6E-03

Note:

1. Rate 22 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the FEBE pattern 21. (see table 5.4-1)

● VC1 FEBE

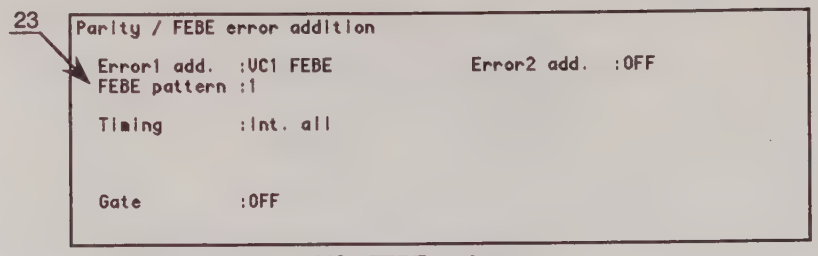


Fig. 5.4-49 VC1 FEBE settings

FEBE pattern — Sets the added pattern at 23.
The setting range is as follows:

[Setting range] 0 ～ 1 ／ bit-pattern settings

Table 5.4-1 Error addition

Item	Bit rate /Unit	1 frame bit No.	Mask:V/ FEBE	Int. rate		Int. all
				Minimum	Maximum	
B1	52 M	6480	1	7.4E-11	7.7E-05	1.5E-04
			8	5.9E-10	6.2E-04	1.2E-03
	156 M	19440	1	2.5E-11	2.6E-05	5.1E-05
			8	2.0E-10	2.1E-04	4.1E-04
	622 M	77760	1	6.1E-12	6.4E-06	1.3E-05
			8	4.9E-11	5.1E-05	1.0E-04
	2488 M	311040	1	1.5E-12	1.6E-06	3.2E-06
			8	1.2E-11	1.3E-05	2.6E-05
B2	52 M	6408	1	7.4E-11	7.8E-05	1.6E-04
			8	6.0E-10	6.2E-04	1.2E-03
	156 M	19224	1	2.5E-11	2.6E-05	5.2E-05
			24	6.0E-10	6.2E-04	1.2E-03
	622 M	76896	1	6.2E-12	6.5E-06	1.3E-05
			96	6.0E-10	6.2E-04	1.2E-03
	2488 M	307584	1	1.6E-12	1.6E-06	3.3E-06
			384	6.0E-10	6.2E-04	1.2E-03
B3	VC3(TU3)	4680	1	1.0E-10	1.1E-04	2.1E-04
			8	8.2E-10	8.5E-04	1.7E-03
	VC3 (SDH)	6120	1	7.8E-11	8.2E-05	1.6E-04
			8	6.2E-10	6.5E-04	1.3E-03
	VC3 (SONET)	6264	1	7.6E-11	8.0E-05	1.6E-04
			8	6.1E-10	6.4E-04	1.3E-03
	VC4	18792	1	2.5E-11	2.7E-05	5.3E-05
			8	2.0E-10	2.1E-04	4.3E-04
	VC4-4c	75168	1	6.3E-12	6.7E-06	1.3E-05
			8	5.1E-11	5.3E-05	1.1E-04
	VC4-16c	300672	1	1.6E-12	1.7E-06	3.3E-06
			8	1.3E-11	1.3E-05	2.7E-05
BIP-2	VC11	832	1	5.7E-10	1.5E-04	1.2E-03
			2	1.1E-09	3.0E-04	2.4E-03
	VC11(TU12) VC12	1120	1	4.3E-10	1.1E-04	8.9E-04
			2	8.5E-10	2.2E-04	1.8E-03
Sect. FEBE	52 M	6408	1	7.4E-11	7.8E-05	1.6E-04
			127	9.5E-09	9.9E-03	2.0E-02
	156 M	19224	1	2.5E-11	2.6E-05	5.2E-05
			127	3.2E-09	3.3E-03	6.6E-03
	622 M	76896	1	6.2E-12	6.5E-06	1.3E-05
			127	7.9E-10	8.3E-04	1.7E-03
B3 FEBE	VC3(TU3)	4680	1	1.0E-10	1.1E-04	2.1E-04
			15	1.5E-09	1.6E-03	3.2E-03
	VC3 (SDH)	6120	1	7.8E-11	8.2E-05	1.6E-04
			15	1.2E-09	1.2E-03	2.5E-03
	VC3 (SONET)	6264	1	7.6E-11	8.0E-05	1.6E-04
			15	1.1E-09	1.2E-03	2.4E-03
	VC4	18792	1	2.5E-11	2.7E-05	5.3E-05
			15	3.8E-10	4.0E-04	8.0E-04
	VC4-4c	75168	1	6.3E-12	6.7E-06	1.3E-05
			15	9.5E-11	1.0E-04	2.0E-04
	VC4-16c	300672	1	1.6E-12	1.7E-06	3.3E-06
			15	2.4E-11	2.5E-05	5.0E-05
VC1 FEBE	VC11	832	1	—	—	1.2E-03
	VC11(TU12) VC12	1120	1	—	—	8.9E-04

5. 4. 8 APS test

The APS test is set here.

[Setting items] The following items can be set.

Normal pattern	K1 pattern
	K2 pattern
Test pattern	K1 pattern
	K2 pattern

[Operation screen] The settings can be performed on the following screen.

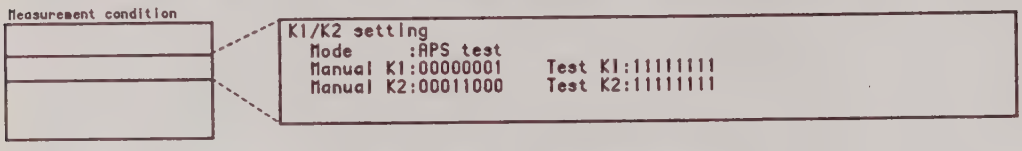


Fig. 5.4-50 APS test setting screen

Note:
1. APS test cannot be executed when the Format of Route setting is PRGM.
2. Alarm addition cannot be performed at the APS test execution condition.

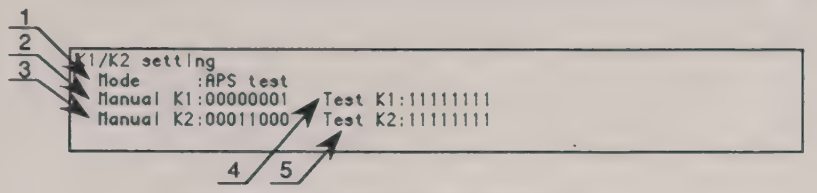


Fig. 5.4-51 APS test pattern settings

Mode — Sets the K1 / K2 setting mode at 1.
The setting range is as follows.

[Setting range] APS test : Automatic Protection Switching

Manual K1
Manual K2 — Sets the Normal pattern of K1/K2 at 2 and 3.
The setting range is as follows.

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

Test K1
Test K2 — Sets the Test pattern of K1/K2 at 4 and 5.
The setting range is as follows.

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

5. 4. 9 Pointer sequence test

The items for pointer test are set here.

[Setting items] The following items can be set.

- ● CCITT G.783
  - Single of opposite polarity
  - Regular with double
  - Regular with missing
  - Double of opposite polarity
- ● T1X 1.6
  - Burst with 3 pointer
  - Periodic with addition
  - Periodic with cancellation
- ● User program
  - Burst
  - Periodic with addition
  - Periodic with cancellation
  - Opposite polarity
  - Regular with double
  - Regular with missing

[Operation screen] The settings can be performed on the following screen.

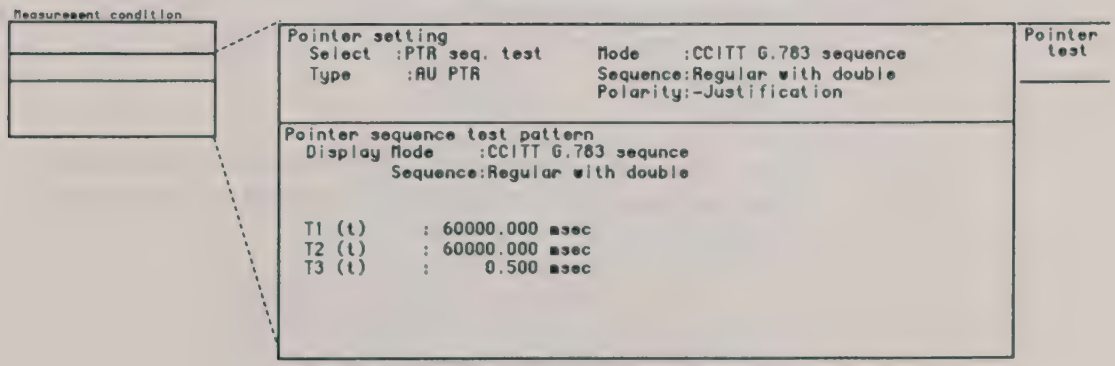


Fig. 5.4-52 Pointer sequence test setting screen

Note: The execution of pointer sequence test needs to the electrical option-25 or 26.

[Related items] The following items are affected.

Test pattern : Cons. 0/1
Route setting : Format

● Setting of execution condition

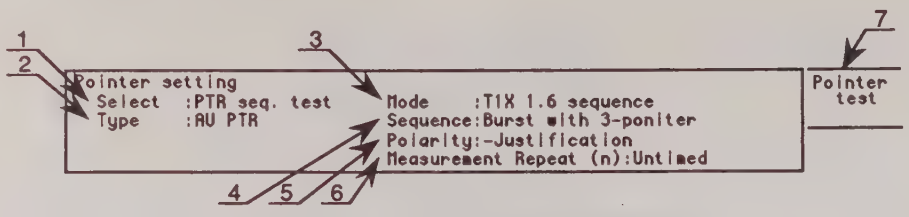


Fig. 5.4-53 Pointer sequence test settings

Select Sets the pointer setting mode at 1.
The setting range is as follows:

[Setting range] PTR seq. test

Note: Select 1 cannot be set when the Format of Route setting is PRGM.

Type Sets the type of executed pointer at 2.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Note: Setting range has following restrictions according to the Unit and Format of Route setting and the Info. pattern of test pattern.

Unit	Format	Info. pattern	Setting range	
			AU	TU
VC11	Bulk	(Don't care)	○	○
VC11(TU12)	locked		○	×
VC12	Except above	Add	○	×
		Except above	○	○
VC3(TU3)	Bulk	(Don't care)	○	○
	Except above	Add	○	×
		Except above	○	○
VC3 VC4 VC4-4c VC4-16c	(Don't care)		○	×
Except above			×	×

○ : Settable

Mode

Sets the generation mode at 3.
The setting range is as follows:

[Setting range]
CCITT G.783 sequence
T1X 1.6 sequence
User program sequence

Sequence

Sets the execution sequence at 4.
The setting range is as follows:

[Setting range]
Burst with 3-pointer
Periodic with addition
Periodic with cancellation
Single of opposite polarity
Regular with double
Regular with missing
Double of opposite polarity
Burst
Opposite polarity

Note: Setting range has following restrictions according to the Mode 3.

Setting range	Mode		
	G.783	T1X 1.6	User
Burst with 3-pointer	○	×	×
Periodic with addition	○	×	○
Periodic with cancellation	○	×	○
Single of opposite polarity	×	○	×
Regular with double	×	○	○
Regular with missing	×	○	○
Double of opposite polarity	×	○	×
Burst	×	×	○
Opposite polarity	×	×	○

○ : Settable

Polarity

Sets the Adjustment polarity at 5.
The setting range is as follows:

[Setting range]
+Justification
-Justification

Note: Polarity 5 cannot be set when the Sequence 4 is Single of opposite polarity or Double of opposite polarity.

Measurement Repeat (n)

Sets the repeat time of measurement section at 6.
The setting range is as follows:

[Setting range] 1 ~ 4095 / step 1 or Untimed

Note: Measurement Repeat (n) 6 cannot be set when the Mode 3 is CCITT G.783 sequence.

Pointer test

Controls the execution of Pointer sequence test by using the 'Pointer test' function key at 7.
The setting range is as follows:

[Setting range] Pointer test OFF : Does not Pointer test
Pointer test ON : Executes pointer test

Note:
1. At Pointer test ON, the 'Pointer test' function key label is reverse-displayed and the Pointer test is executed.
2. At Pointer test OFF, the reverse-displayed 'Pointer test' function key label goes off and the Pointer test is not executed.

● Pattern settings

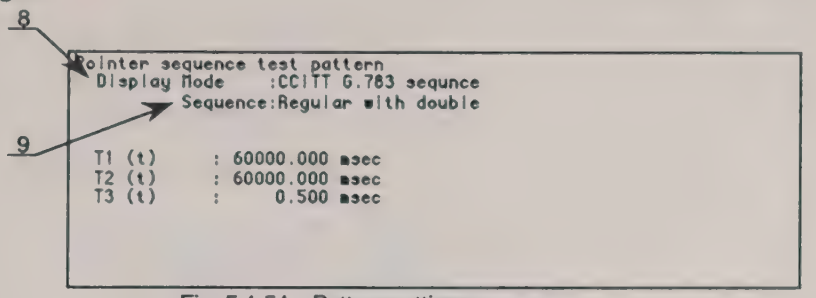


Fig. 5.4-54 Pattern settings

Display Mode Sets the generation mode performed pattern editing 8.
The setting range is as follows:

[Setting range]
- CCITT G.783 sequence
- T1X 1.6 sequence
- User program sequence

Sequence Sets the execution sequence performed pattern editing at 9.
The setting range is as follows:

[Setting range]
- Burst with 3-pointer
- Periodic with addition
- Periodic with cancellation
- Single of opposite polarity
- Regular with double
- Regular with missing
- Double of opposite polarity
- Burst
- Opposite polarity

Note: Setting range has following restrictions according to the Display Mode 8.

Setting range	Mode		
	G.783	T1X 1.6	User
Burst with 3-pointer	○	×	×
Periodic with addition	○	×	○
Periodic with cancellation	○	×	○
Single of opposite polarity	×	○	×
Regular with double	×	○	○
Regular with missing	×	○	○
Double of opposite polarity	×	○	×
Burst	×	×	○
Opposite polarity	×	×	○

○ : Settable

◆ Burst with 3-pointer (T1X 1.6)

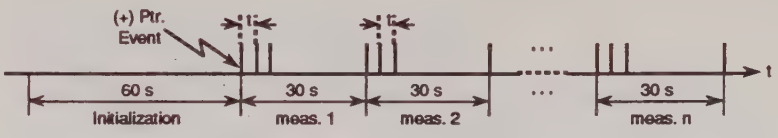


Fig. 5.4-55 Event time diagram (+PJC)

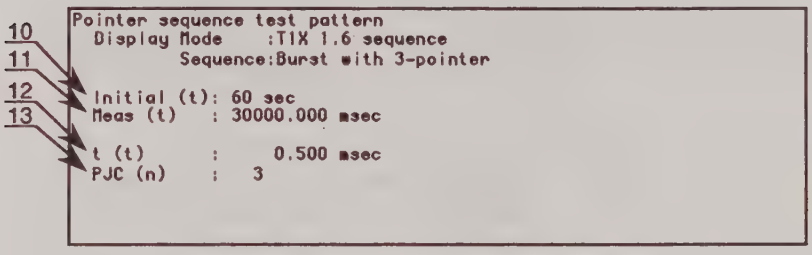


Fig. 5.4-56 Burst with 3-pointer settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 30000.000 msec

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 3

(Trigger output)

Trigger signal can be output at Burst with 3-pointer execution.
The output condition is as follows:

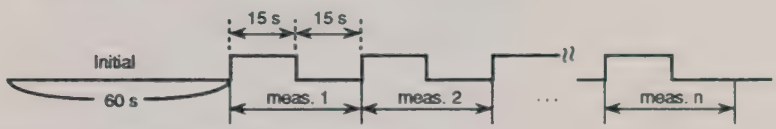


Fig. 5.4-57 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Periodic with addition (T1X 1.6)

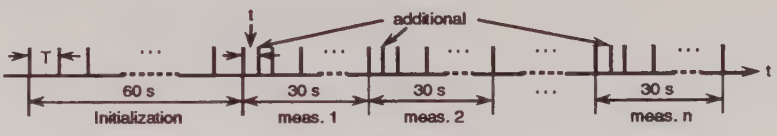


Fig. 5.4-58 Event time diagram (+PJC)

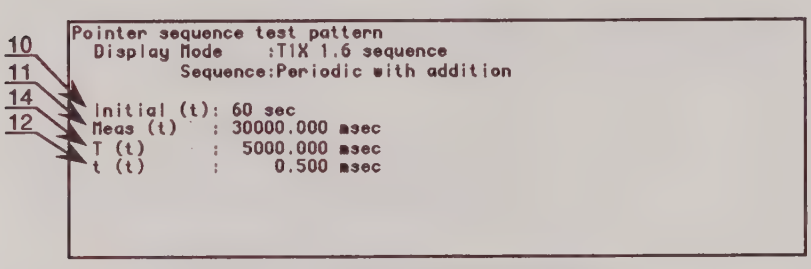


Fig. 5.4-59 Periodic with addition settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 30000.000 msec

t (t) Sets the generation interval of added PJC at 12.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[setting range] 1.000 ~ 30000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 30000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 30000ms

(Trigger output) Trigger signal can be output at Periodic with addition execution.
The output condition is as follows:

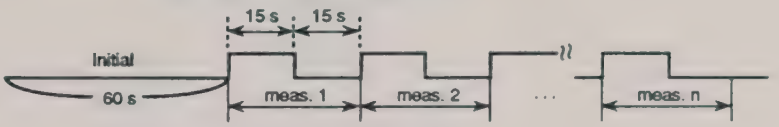


Fig. 5.4-60 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Periodic with cancellation (T1X 1.6)

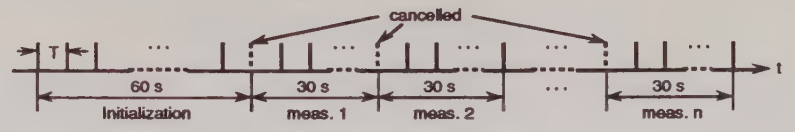


Fig. 5.4-61 Event time diagram (+PJC)

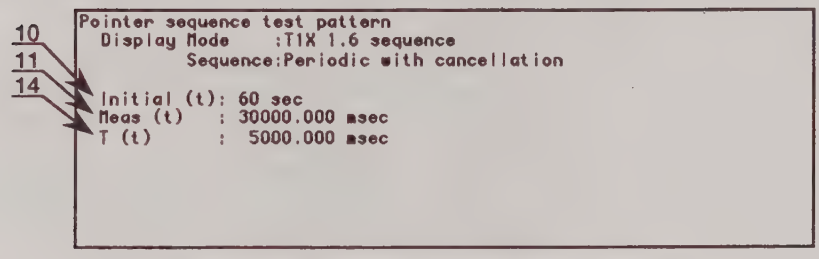


Fig. 5.4-62 Periodic with cancellation settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period 11.
The setting range is as follows:

[Setting range] 30000.000 msec

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 1.000 ~ 30000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 30000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 30000ms

(Trigger output)

Trigger signal can be output at Periodic with cancellation execution.
The output condition is as follows:

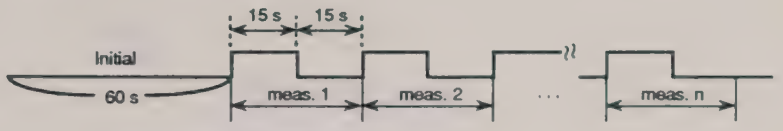


Fig. 5.4-63 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Single of opposite polarity (G.783)

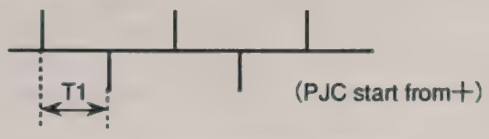


Fig. 5.4-64 Event time diagram

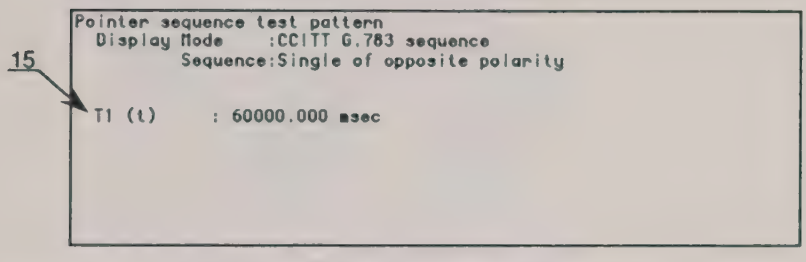


Fig 5.4-65 Single of opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

(Trigger output) Trigger signal can be output at Single of opposite polarity execution.
The output condition is as follows:

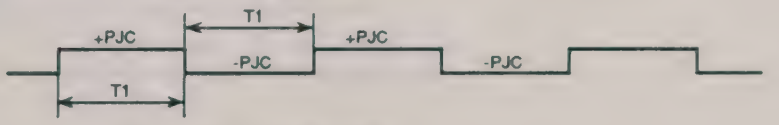


Fig. 5.4-66 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Regular with double (G.783)

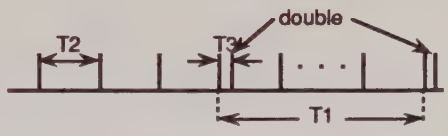


Fig. 5.4-67 Event time diagram (+PJC)

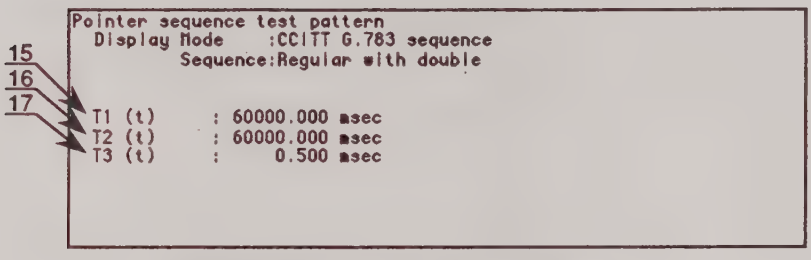


Fig. 5.4-68 Regular with double settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step T2

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note:

1. Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

2. T1 is changed by T2 value.

T3 (t)

Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note:

Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

(Trigger output)

Trigger signal can be output at Regular with double execution.
The output condition is as follows:

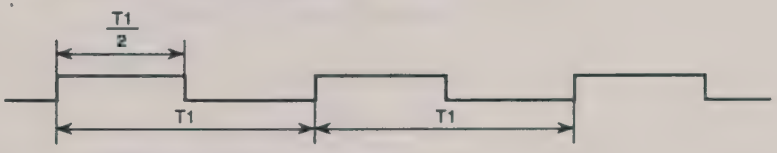


Fig. 5.4-69 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Regular with missing (G.783)

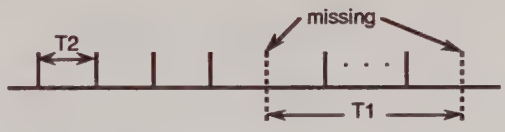


Fig. 5.4-70 Event time diagram (+PJC)

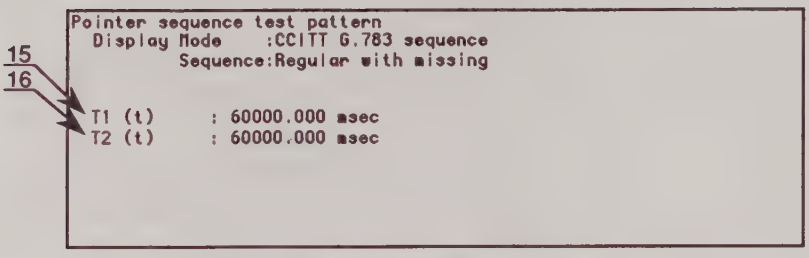


Fig. 5.4-71 Regular with missing settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step T2

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note:

1. Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

2. T1 is changed by T2 value.

(Trigger output)

Trigger signal can be output at Regular with missing execution.
The output condition is as follows:

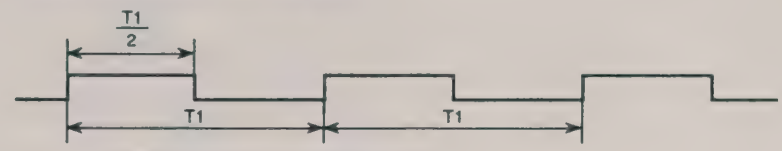


Fig. 5.4-72 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Double of opposite polarity (G.783)

Fig. 5.4-73 Event time diagram

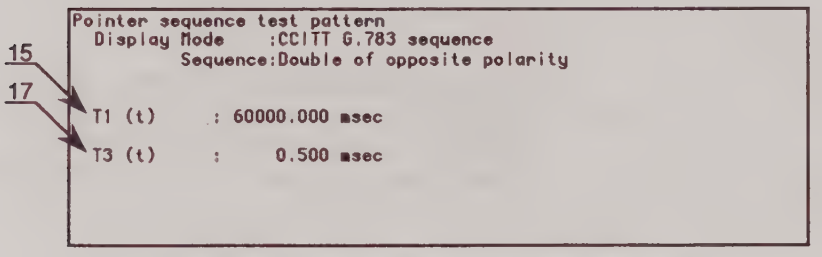


Fig. 5.4-74 Double of opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

T3 (t) Sets the generation period of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

(Trigger output)

Trigger signal can be output at Double of opposite polarity execution. The output condition is as follows:

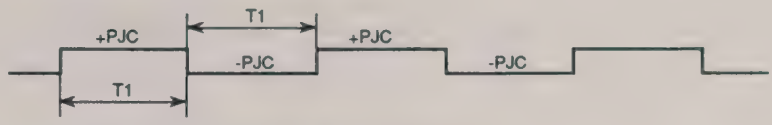


Fig. 5.4-75 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'. Setting method sees section 5.4.11 Trigger output.

◆ Burst (User)

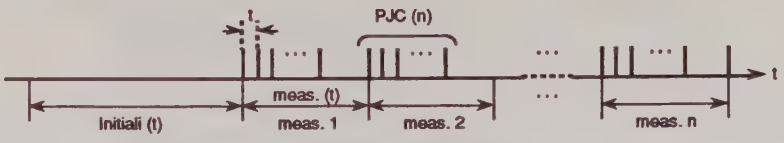


Fig. 5.4-76 Event time diagram (+PJC)

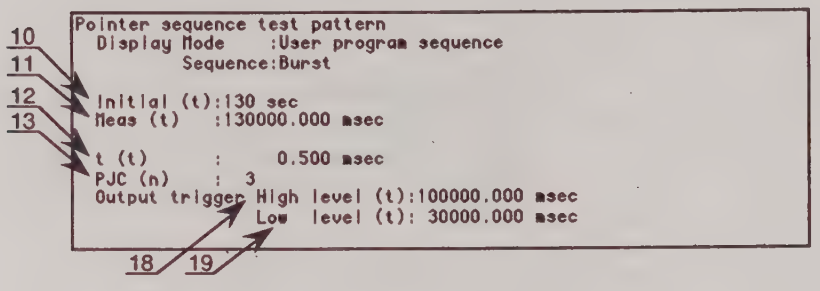


Fig. 5.4-77 Burst settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting. However, Meas (t) ≧ t (t) x PJC (n)

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] Same as Meas (t) 11

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 0 ~ 4095 / step 1

(Trigger output)

Trigger signal can be output at Burst execution.
The output condition is as follows:

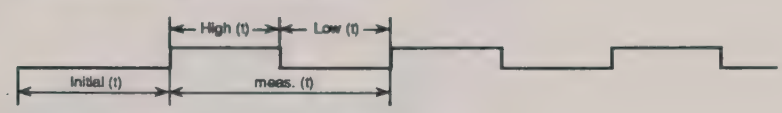


Fig. 5.4-78 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

Output trigger High level (t)

Sets the 'H' level time of trigger signal at 18. (see Fig. 5.4-78)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec

Note:

Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t)

Sets the 'L' level time of trigger signal at 19. (see Fig. 5.4-78)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Periodic with addition (User)

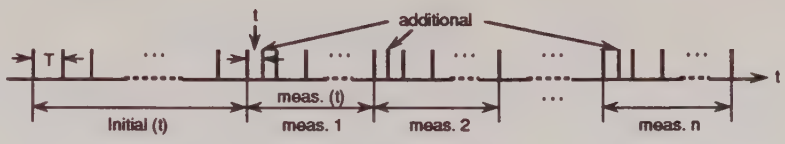


Fig. 5.4-79 Event time diagram (+PJC)

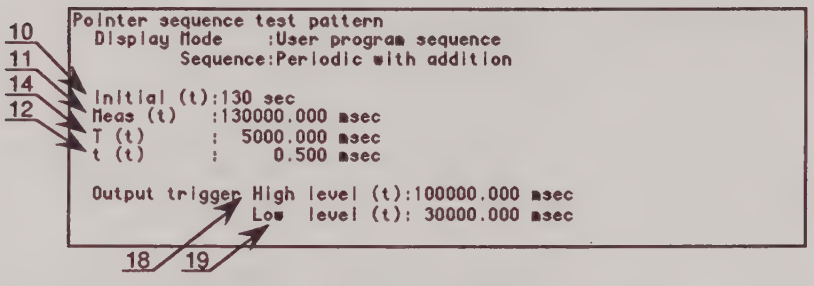


Fig. 5.4-80 Periodic with addition settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] Same as Meas (t) 11

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms / 0.5

(Trigger output) Trigger signal can be output at Periodic with addition execution.
The output condition is as follows:

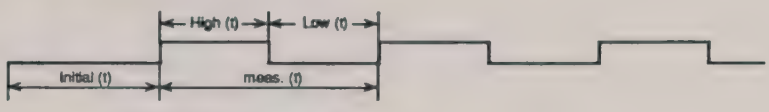


Fig. 5.4-81 Trigger signal

Note: Trigger signal outputs when tthe Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.4-81)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.4-81)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Periodic with cancellation (User)

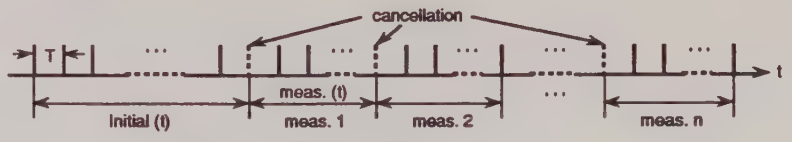


Fig. 5.4-82 Event time diagram (+PJC)

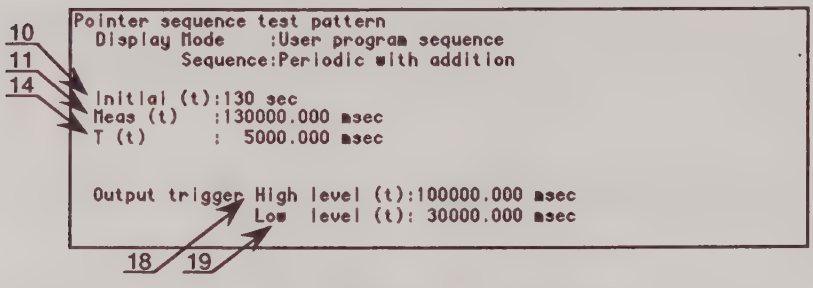


Fig. 5.4-83 Periodic with addition setting

Initial (t) Sets the initialize time at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement time at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms ／0.5

(Trigger output) Trigger signal can be output at Periodic with cancellation execution.
The output condition is as follows:

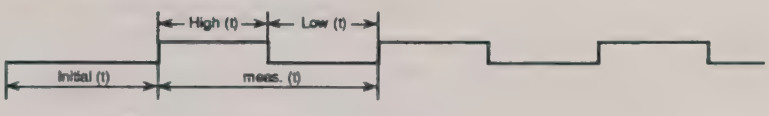


Fig. 5.4-84 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.4-84)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec ／ step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms ／0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.4-84)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Opposite polarity (User)

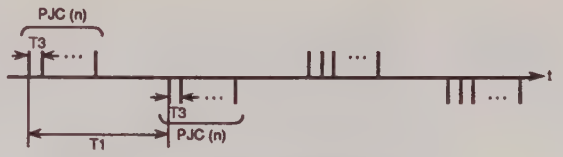


Fig. 5.4-85 Event time diagram

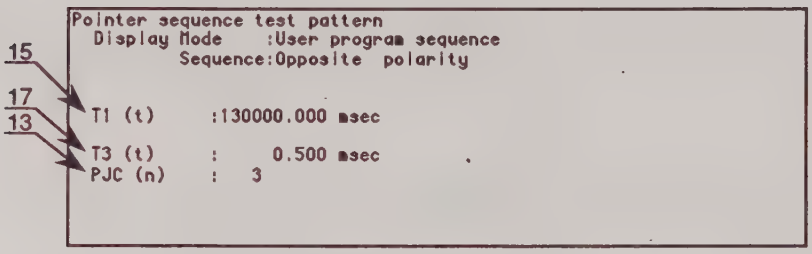


Fig. 5.4-86 Opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T3 x PJC (n).

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms / 0.5

T3 (t) Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 1 ~ 1000 / step 1

(Trigger output)

Trigger signal can be output at Opposite polarity execution.
The output condition is as follows:

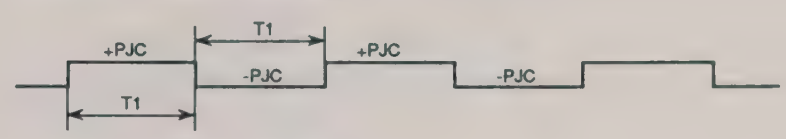


Fig. 5.4-87 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

◆ Regular with double (User)

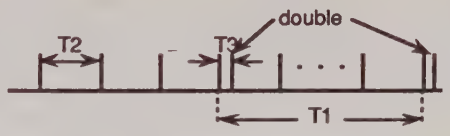


Fig. 5.4-88 Event time diagram

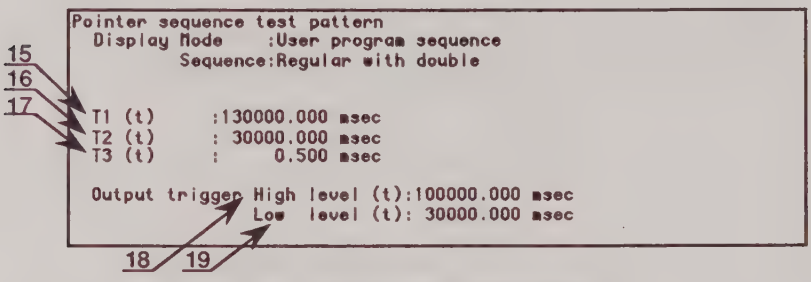


Fig. 5.4-89 Regular with double settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2 and T2 > T3.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms / 0.5

T3 (t) Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms ／0.5

(Trigger output) Trigger signal can be output at Regular with double execution.
The output condition is as follows:

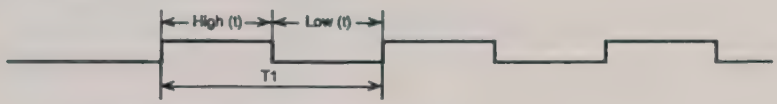


Fig. 5.4-90 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.4-90)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec ／ step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms ／0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.4-90)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Regular with missing (User)

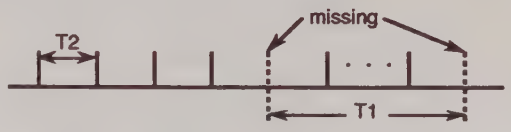


Fig. 5.4-91 Event time diagram (+PJC)

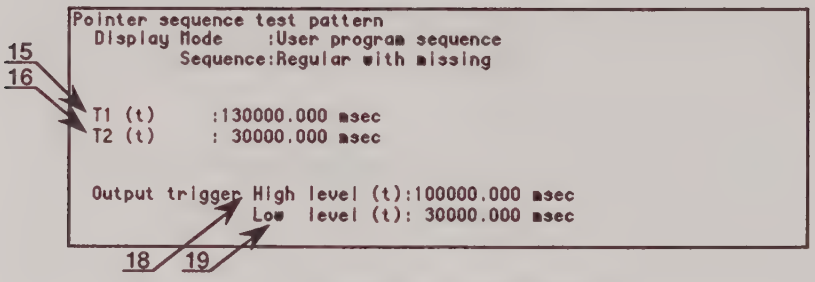


Fig. 5.4-92 Regular with missing settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms ／0.5

(Trigger output)

Trigger signal can be output at Regular with missing execution.
The output condition is as follows:

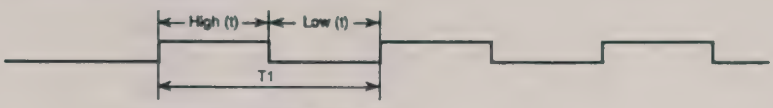


Fig. 5.4-93 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.4.11 Trigger output.

Output trigger
High level (t)

Sets the 'H' level time of trigger signal at 18. (see Fig. 5.4-93)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec / step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t)

Sets the 'L' level time of trigger signal at 19. (see Fig. 5.4-93)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

5. 4. 10 Delay measurement

The items for Delay measurement are set here.

[Setting items] The following items can be set.

Interval	OFF
	0.5 sec
	1.0 sec
	2.0 sec
	5.0 sec
	10 sec

[Operation screen] The settings can be performed on the following screen.

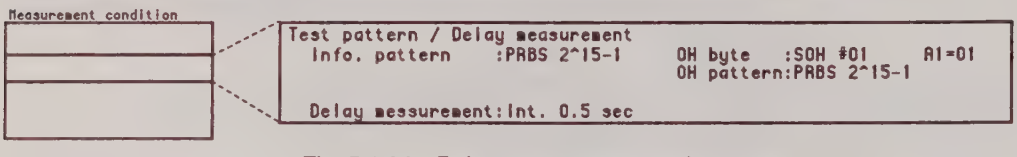


Fig. 5.4-94 Delay measurement setting screen

Note:
1. Delay measurement can be set when the Format of Route setting is PRGM.
2. At Delay measurement execution condition, the following items cannot be set.
   - Cons. 0/1 pattern
   - Alarm addition
   - Bit error addition
   - Parity / FEBE error addition

[Related items] The following items are affected.
Trigger output is set to Delay measurement automatically.

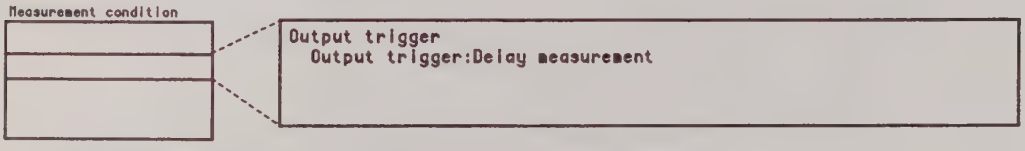


Fig. 5.4-95 Related screen

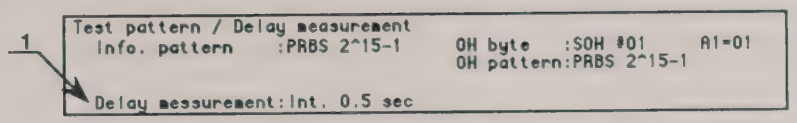


Fig. 5.4-96 Delay measurement settings

Delay measurement

Sets the output interval of signal for Delay measurement at 1.
The setting range is as follows:

[Setting range]
- OFF
- Int. 0.5 sec
- Int. 1.0 sec
- Int. 2.0 sec
- Int. 5.0 sec
- Int. 10 sec

5. 4. 11 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source	OFF
	Alarm/APS test
	Bit error
	Parity/FEBE error
	AU PTR change
	AU PTR +PJC
	AU PTR - PJC
	TU PTR change
	TU PTR +PJC
	TU PTR -PJC
	Info. PRBS sync
	Frame pulse
	Multi-frame pulse
	K1/K2 manual
	Cons. 0/1
	Pointer seq. test
	SOH/POH
	Delay measurement

[Operation screen] The settings can be performed on the following screen.

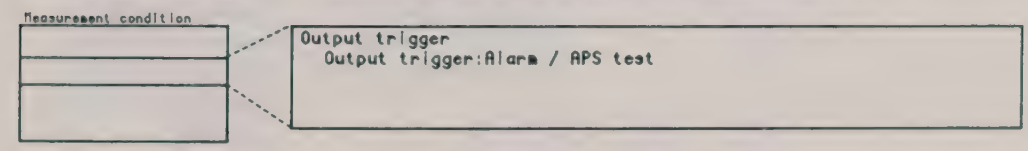


Fig. 5.4-97 Trigger output setting screen

Note: The setting of following items needs electrical option-25 or 26.
- TU PTR change, +PJC, -PJC
- Multi-frame pulse
- Pointer seq. test

[Related items] The following items are affected.

Route setting	:	Unit, Format
Test pattern	:	Information pattern/Frame, 0/1 consecutive pattern
K1/K2 pattern	:	Manual setting
Pointer sequence test		
Delay measurement		

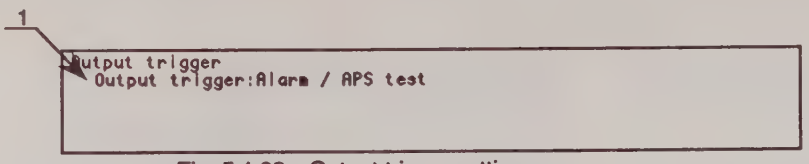


Fig. 5.4-98 Output trigger settings

Output trigger — Sets the output trigger source at 1.
The setting range is as follows:

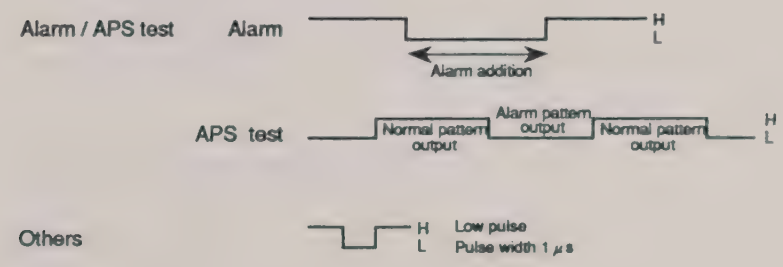
[Setting range]

OFF	: Does not output trigger
Alarm / APS test	: Outputs at alarm addition time or APS test set time
Bit error	: Outputs at Bit error addition time
Parity / FEBE error	: Outputs at Parity/FEBE error addition time
AU PTR change	: Outputs at PTR change time except PJC
AU PTR +PJC	: Outputs at +PJC time
AU PTR −PJC	: Outputs at -PJC time
TU PTR change	: Outputs at PTR change time except PJC
TU PTR +PJC	: Outputs at +PJC time
TU PTR −PJC	: Outputs at -PJC time
Info. PRBS sync.	: Outputs at max. 0s consecutive of PRBS signal time
Frame pulse	: Outputs at SOH 1 row generation time
Multi-frame pulse	: Outputs synchronized frame at Multi-frame
K1 / K2 manual	: Outputs at K1/K2 manual change time
Cons. 0/1	: Outputs at 0/1 consecutive signal generation time
Pointer seq. test	: Outputs at Pointer sequence test execution time
SOH / POH	: Outputs at SOH/POH specified 1 byte
Delay measurement	: Outputs at Delay measurement start time

Note:

1. AU PTR change, +PJC and -PJC cannot be set when the Format of Route setting is PRGM or the Pointer setting is Pointer sequence test (type: AU PTR).
2. TU PTR change, +PJC and -PJC cannot be set when the Format of Route setting is PRGM or locked, or the Pointer setting is Pointer sequence test (type: TU PTR).
3. Cons. 0/1 cannot be set when the Cons. 0/1 of test pattern is unsettable or OFF.
4. Delay measurement cannot be set when the Delay measurement is unsettable or OFF. (→ see section 5.4.10)
5. Info. PRBS sync. can be set when the Info. pattern of test pattern is PRBS pattern.
6. Multi-frame pulse can be set when the Unit of Route setting is VC11, VC11(TU12) or VC12.
7. K1/K2 manual can be set when the Format of Route setting is except PRGM and K1/K2 setting is Manual.
8. Pointer seq. test can be set when the Pointer setting is Pointer sequence test. (→ see section 5.4.9)

■Trigger signal



● SOH/POH

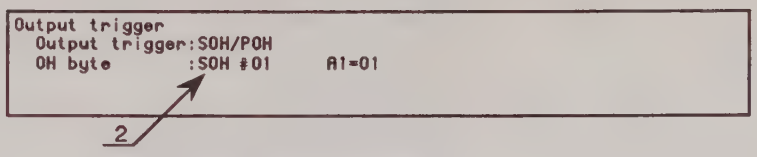


Fig. 5.4-99 SOH/POH settings

Type Sets the type of trigger output OH at 2.
The setting range is as follows:

[Setting range] SOH
POH

Note:
1. Type 2 can be set when the Output trigger 1 is SOH/POH.
2. POH cannot be set when the Format of Route setting is PRGM.

◆ SOH

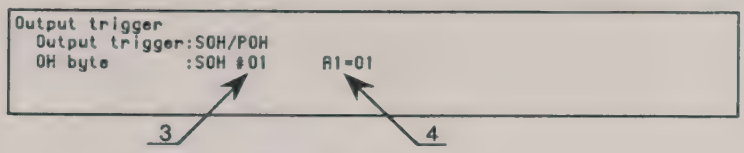


Fig. 5.4-100 SOH settings

SOH #No. Sets the trigger output SOH No. at 3.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note:

1. SOH #No. 3 can be set when the Type 2 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH byte Sets the byte of trigger output SOH at 4.
The setting range is as follows:

[Setting range] Arbitrary 1 byte

Note: SOH byte 4 can be set when the Type 2 is SOH.

◆ POH

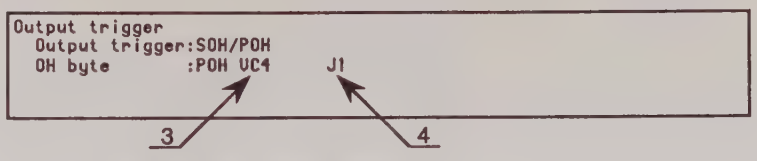


Fig. 5.4-101 POH settings

POH type Sets the type of trigger output POH at 3.
The setting range is as follows:

[Setting range] VC4-16c
VC4-4c
VC4
VC3
VC1

Note:

1. POH type 3 can be set when the Type 2 is POH.
2. Setting range has following restrictions according to the Route setting.

Unit	Format	Route1	Setting range
VC11 VC11(TU12) VC12	Except locked	AU3	VC3, VC1
		AU4	VC4,VC1
	locked	AU3	VC3
		AU4	VC4
VC3(TU3)	(Don't care)		VC4, VC3
VC3			VC3
VC4			VC4
VC4-4c			VC4-4c
VC4-16c			VC4-16c
Except above			Unsettable

POH byte Sets the byte of trigger output POH at 4.
The setting range is as follows:

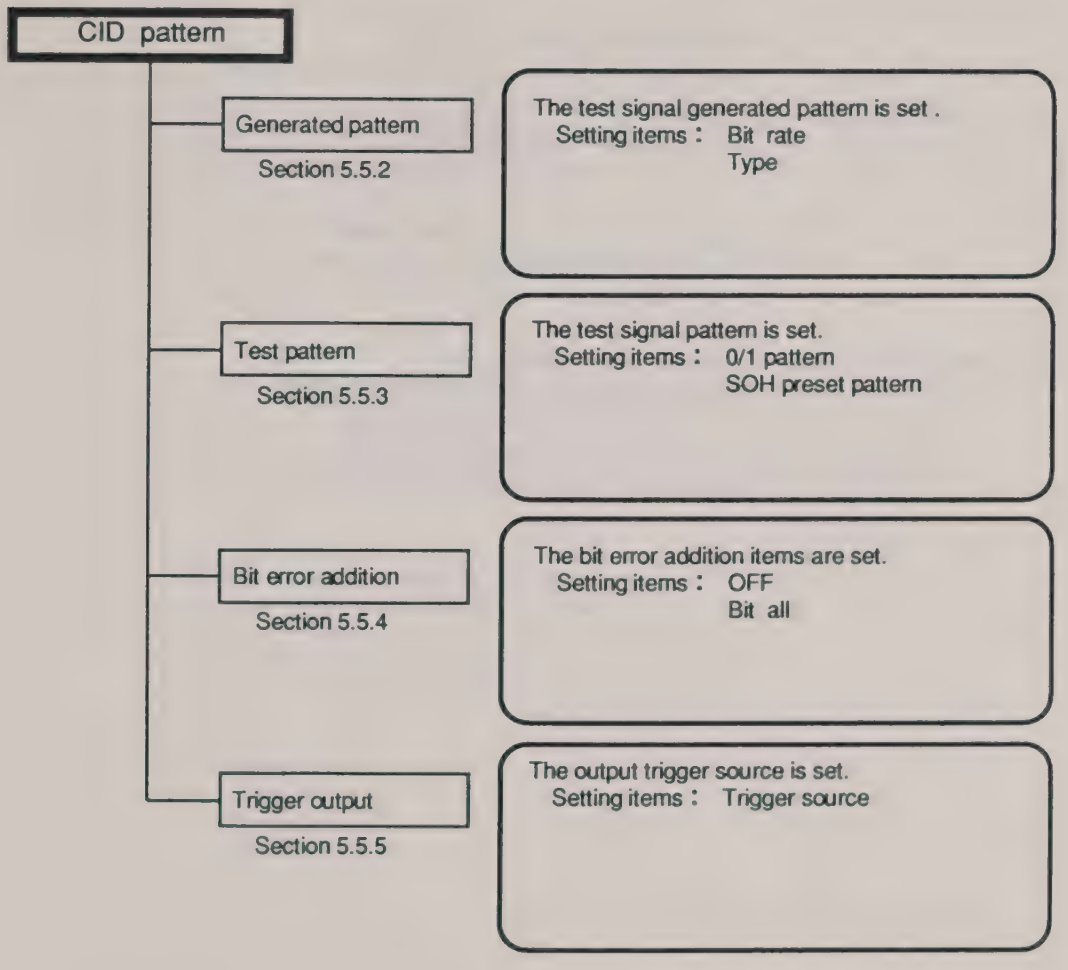
[Setting range] ◆VC3, VC4, VC4-4c, VC4-16c
Arbitrary 1 byte
◆VC1
V5, J2, Z6, Z7

Note: POH byte 4 can be set when the Type 2 is POH.

5. 5 Setting CID pattern

5. 5. 1 List of functions

The pattern based on CCITT G.958 is output.
The CID pattern functions are listed below.



5. 4. 2 Setting generated pattern

The test signal generated patternl is set here.

[Setting items] The following items can be set.

- Bit rate
- Type

[Operation screen] The settings can be performed on the following screen.

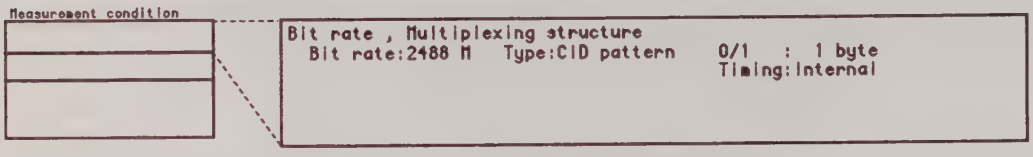


Fig. 5.5-1 Generated pattern setting screen

[Related items] The following items are affected.

Equipment name : ME3520A／ME3620A

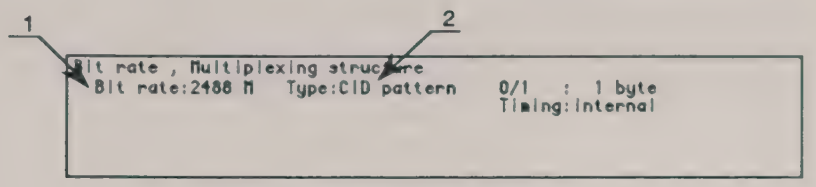


Fig. 5.5-2 Generated pattern settings

Bit rate Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings. (→ See section 5.11)

Type Sets the Type of output signal at 2
The setting range is as follows:

[Setting range] CID pattern

5. 5. 3 Setting test pattern

The test signal pattern is set here.

[Setting items] The following items can be set.

0/1 pattern

SOH preset pattern

[Operation screen] The settings can be performed on the following screen.

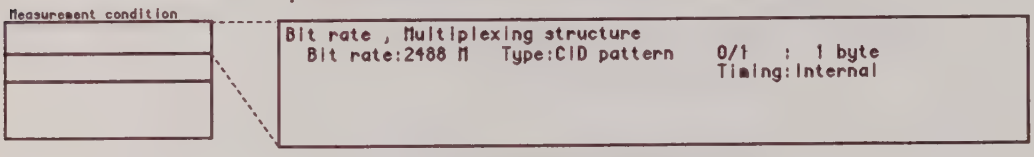


Fig. 5.5-3 Test pattern setting screen

In addition, the following screen are available as pattern editing screen.

- PRGM SOH/POH preset data screen

● 0／1 pattern

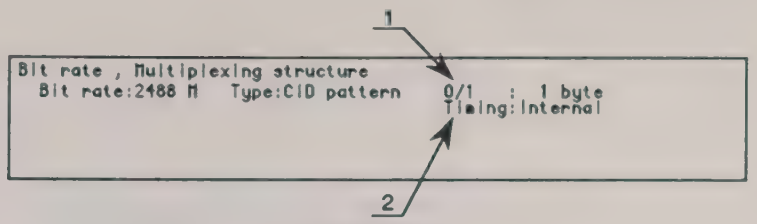


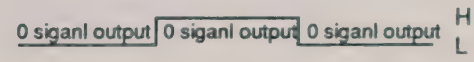
Fig. 5.5-4 0/1 pattern settings

0/1 Sets the inserted byte No. at 1.
The setting range is as follows:

[Setting range] 1 ～ 100 ／ step 1

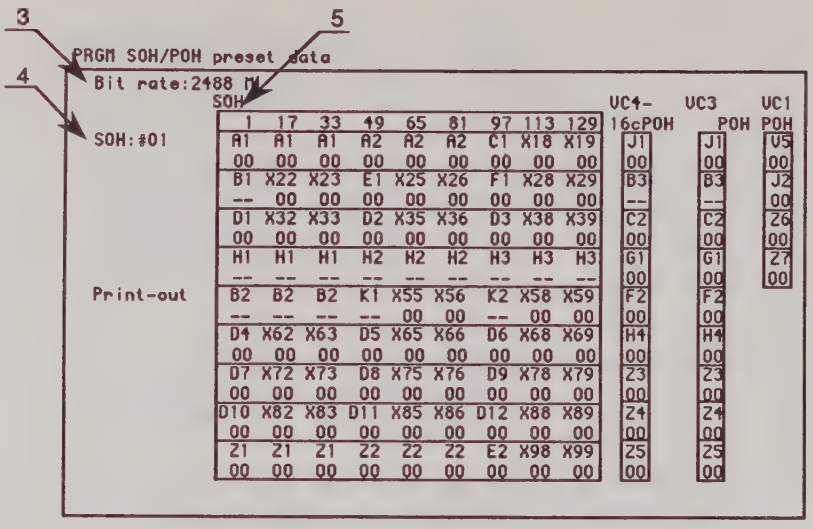
Timing Sets the switching method of 0/1 signal at 2.
The setting range is as follows:

[Setting range] Internal : Switching every 125 μsec automatically
External : Switching by input signal from Control Input Alarm/Trigger connector



Note: At External, switches 8k frame signal synchronously.

● SOH preset pattern



SOH 1	17	33	49	65	81	97	113	129	VC4-16cPOH	VC3 POH	VC1 POH
A1	A1	A1	A2	A2	A2	C1	X18	X19	J1	J1	V5
00	00	00	00	00	00	00	00	00	00	00	00
B1	X22	X23	E1	X25	X26	F1	X28	X29	B3	B3	J2
--	00	00	00	00	00	00	00	00	--	--	00
D1	X32	X33	D2	X35	X36	D3	X38	X39	C2	C2	Z6
00	00	00	00	00	00	00	00	00	00	00	00
H1	H1	H1	H2	H2	H2	H3	H3	H3	G1	G1	Z7
--	--	--	--	--	--	--	--	--	00	00	00
B2	B2	B2	K1	X55	X56	K2	X58	X59	F2	F2	
--	--	--	--	00	00	--	00	00	00	00	
D4	X62	X63	D5	X65	X66	D6	X68	X69	H4	H4	
00	00	00	00	00	00	00	00	00	00	00	
D7	X72	X73	D8	X75	X76	D9	X78	X79	Z3	Z3	
00	00	00	00	00	00	00	00	00	00	00	
D10	X82	X83	D11	X85	X86	D12	X88	X89	Z4	Z4	
00	00	00	00	00	00	00	00	00	00	00	
Z1	Z1	Z1	Z2	Z2	Z2	E2	X98	X99	Z5	Z5	
00	00	00	00	00	00	00	00	00	00	00	

Fig. 5.5-5 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 3.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488M can be set only ME3620A.
2. The pattern setting is possible for arbitrary Bit rate, but the output data with the same Bit rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 4.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note: Setting range has following restrictions according to the Bit rate 3.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

SOH pattern

Sets the SOH preset pattern at 5.
The setting range is as follows:

[Setting range] A1, A2, C1, X18, X19

Note:

1. SOH bytes and POH bytes of without setting range can be set, but does not output.
2. X18 and X19 cannot be set when the Bit rate 3 is 52M.

5. 5. 4 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF

All area : Bit all

Bit error add

[Operation screen] The settings can be performed on the following screen.

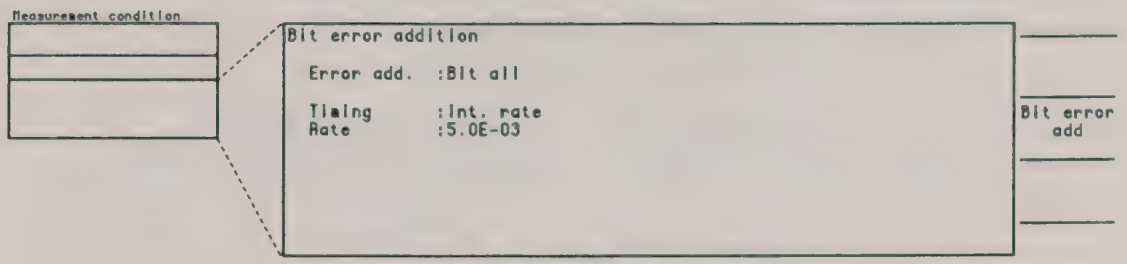


Fig. 5.5-6 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

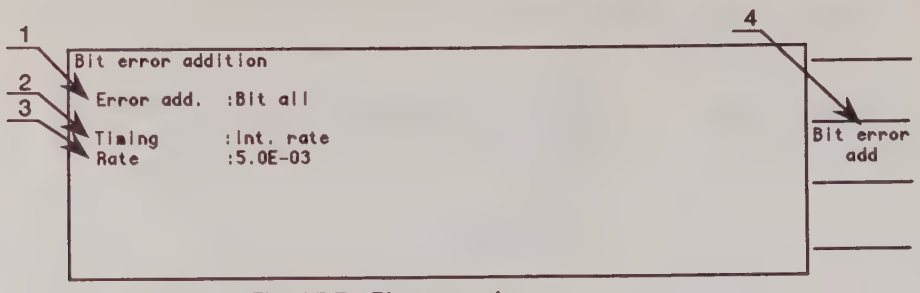


Fig. 5.5-7 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range]
- OFF : Does not add error
- Bit all : Adds error all area of signal

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range]
- Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
- Int. rate : Adds error according to error rate
- Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range]
- 5.0E-03
- 1.0E-03
- 1.0E-04
- 1.0E-05
- 1.0E-06
- 1.0E-07
- 1.0E-08
- 1.0E-09
- 1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 4 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of error item being added (Bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 5. 5 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source
- OFF
- Bit error
- Info. PRBS sync
- Frame pulse
- Multi-frame pulse
- K1／K2 manual
- Cons. 0／1
- CID 0/1 pattern

[Operation screen] The settings can be performed on the following screen.

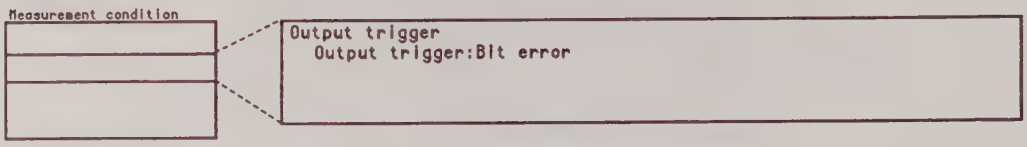


Fig. 5.5-8 Trigger output setting screen

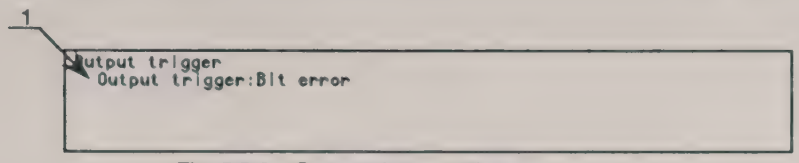


Fig. 5.5-9 Output trigger settings

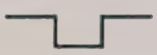
Output trigger

Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Bit error	: Outputs at Bit error addition time
Info. PRBS sync.	: Outputs at max. 0s consecutive of PRBS signal time
Frame pulse	: Outputs at SOH 1 row generation time
Cons. 0/1	: Outputs at 0/1 consecutive signal generation time

■Trigger signal

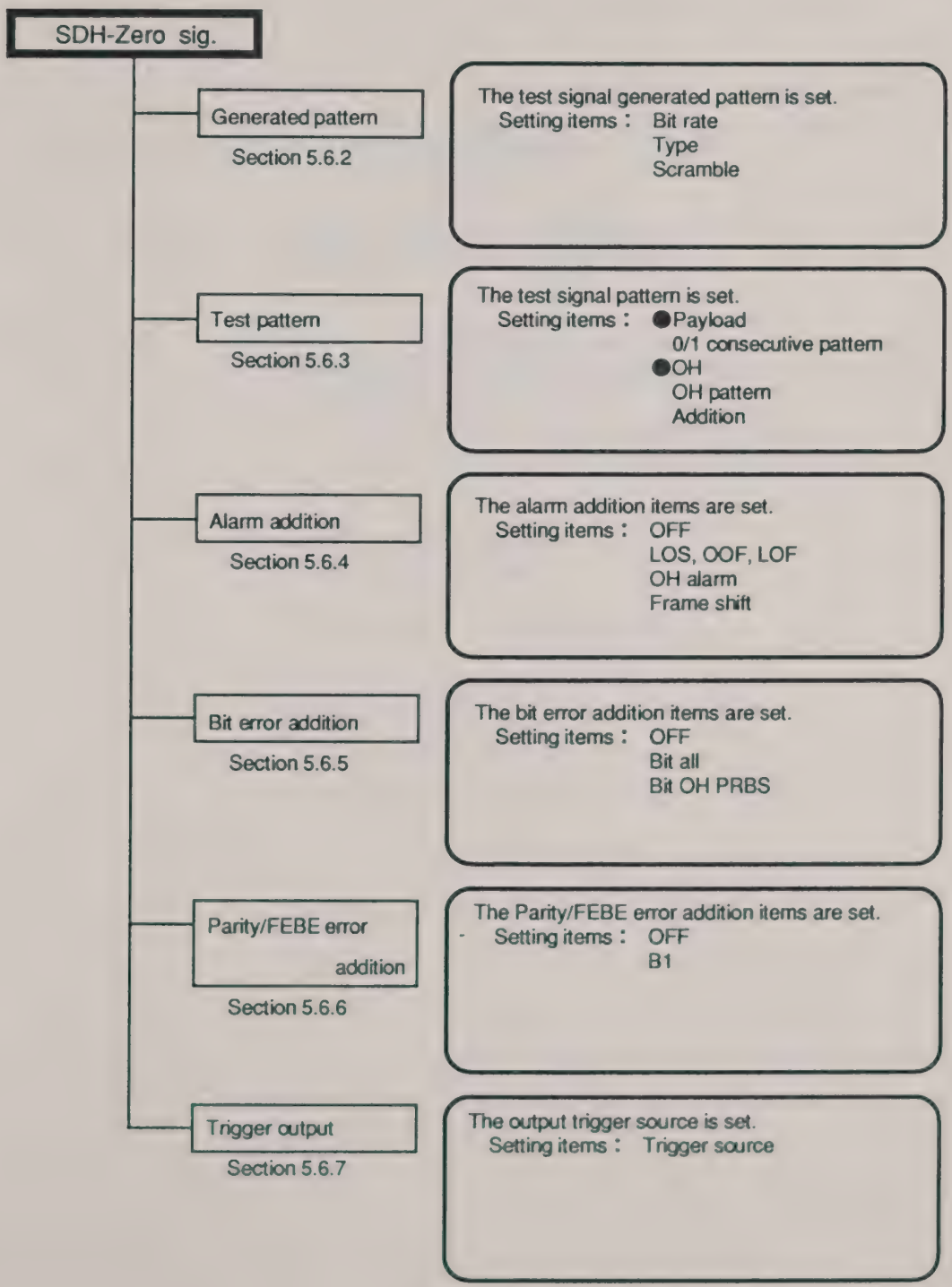


Low pulse
Pulse width 1 μs

5. 6 Setting SDH-Zero sig.

5. 6. 1 List of functions

The all 0s pattern is output except at SOH 1 and 2 row.
The SDH-Zero sig. functions are listed below.



5. 6. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The settings can be performed on the following screen.

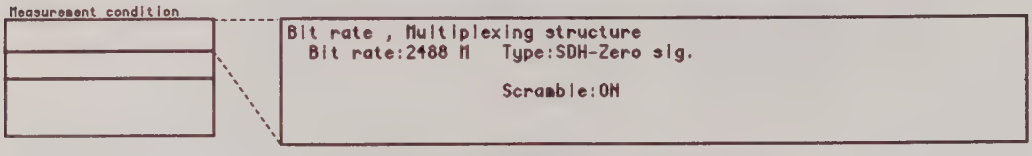


Fig. 5.6-1 Generated pattern setting screen

[Related items] The following item is affected.

Equipment name : ME3520A／ME3620A

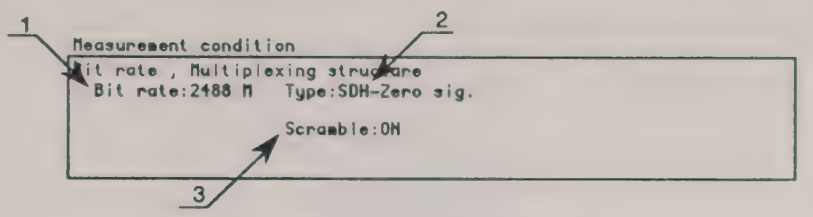


Fig. 5.6-2 Generated pattern settings

Bit rate

Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings. (→ See section 5.11)

Type

Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range] SDH-Zero sig.

Scramble

Sets the Scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 6. 3 Setting test pattern

The test signal pattern is set here.

[Setting items] The following items can be set.

- ● Payload settings
  - 0/1 consecutive pattern
- ● OH settings
  - SOH preset pattern
  - SOH pattern

[Operation screen] The settings can be performed on the following screen.

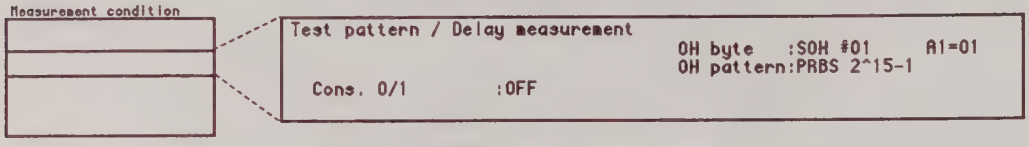


Fig. 5.6-3 Payload setting screen

In addition, the following screen is available as pattern editing screen.

PRGM SOH/POH preset data screen

● 0／1 consecutive pattern

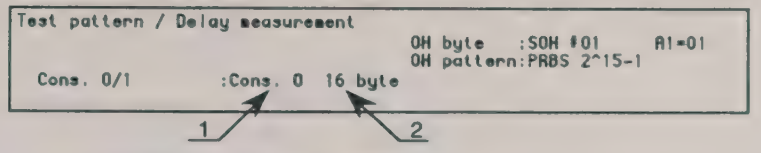


Fig. 5.6-4 Cons. 0/1 settings

Type Sets the type of 0/1 consecutive pattern at 1.
The setting range is as follows:

[Setting range] OFF
Cons. 0
Cons. 1

Byte No. Sets the inserted byte No. at 2.
The setting range is as follows:

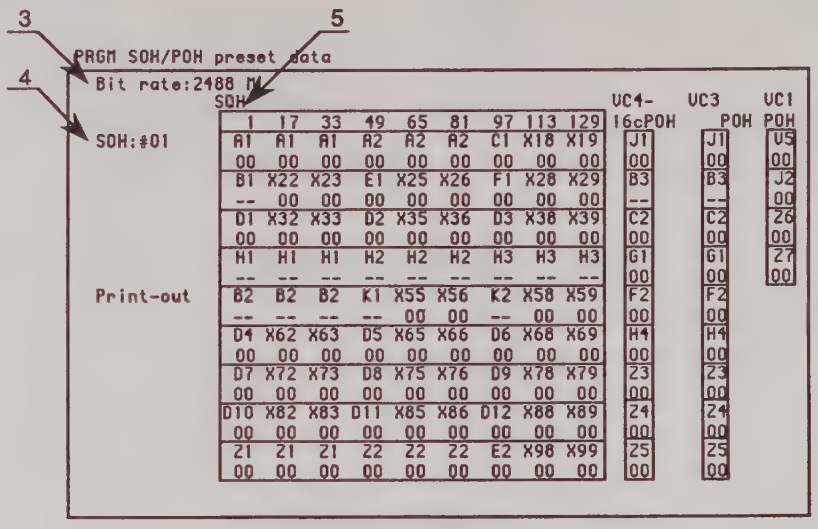
[Setting range] 1 ～ 100 ／ step 1

Note:

1. Byte No. 2 can be set when the Type 1 is Cons.0 or Cons.1.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Byte No.
52 M	1 ～ 87
Except above	1 ～ 100

● SOH preset pattern



1	17	33	49	65	81	97	113	129	VC4-16cPOH	VC3 POH	VC1 POH
A1	A1	A1	A2	A2	A2	C1	X18	X19	J1	J1	V5
00	00	00	00	00	00	00	00	00	00	00	00
B1	X22	X23	E1	X25	X26	F1	X28	X29	B3	B3	J2
--	00	00	00	00	00	00	00	00	--	--	00
D1	X32	X33	D2	X35	X36	D3	X38	X39	C2	C2	Z6
00	00	00	00	00	00	00	00	00	00	00	00
H1	H1	H1	H2	H2	H2	H3	H3	H3	G1	G1	Z7
--	--	--	--	--	--	--	--	--	00	00	00
B2	B2	B2	K1	X55	X56	K2	X58	X59	F2	F2	
--	--	--	--	00	00	--	00	00	00	00	
D4	X62	X63	D5	X65	X66	D6	X68	X69	H4	H4	
00	00	00	00	00	00	00	00	00	00	00	
D7	X72	X73	D8	X75	X76	D9	X78	X79	Z3	Z3	
00	00	00	00	00	00	00	00	00	00	00	
D10	X82	X83	D11	X85	X86	D12	X88	X89	Z4	Z4	
00	00	00	00	00	00	00	00	00	00	00	
Z1	Z1	Z1	Z2	Z2	Z2	E2	X98	X99	Z5	Z5	
00	00	00	00	00	00	00	00	00	00	00	

Fig. 5.6-5 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 3.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. The pattern setting is possible for arbitrary Bit rate, but the output data with the same Bite rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 4.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note: Setting range has following restrictions according to the Bit rate 3.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH pattern

Sets the SOH preset pattern at 5.
The setting range is as follows:

[Setting range] A1, A2, C1, E1, F1, X18, X19, X21, X22, X23, X24, X25, X26, X27, X28, X29

Note:

1. SOH bytes and POH bytes without the setting range can be set, but dose not output.
2. Setting range has following restrictions according to the Bit rate 3 and SOH #No. 4.

Bit rate	SOH #No.	Setting range
52 M	(Don't care)	A1,A2,C1,E1,F1
Except above	#01	A1,A2,C1,X18,X19 X22,X23,E1,X25,X26,F1,X28,X29
	Except above	A1,A2,C1,X18,X19 X21,X22,X23,X24,X25,X26,X27,X28,X29

● SOH pattern

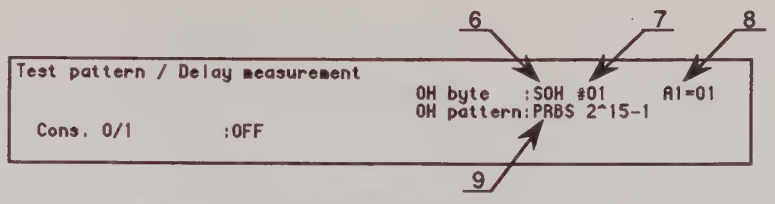


Fig. 5.6-6 SOH pattern settings

Type — Sets the type of OH performed pattern setting at 6.
The setting range is as follows:

[Setting range] OFF
SOH

Note: At OFF, OH byte is not performed pattern setting. In this case, SOH preset pattern is output.

SOH #No. — Sets the SOH No. performed pattern setting at 7.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note:
1. SOH #No 7 can be set when the Type 6 is SOH.
2. Setting range has following restrictions according to the Bit rate 3 of generation pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH byte

Sets the SOH byte performed pattern setting at 8.
The setting range is as follows:

[Setting range] A1, A2, C1, E1, F1, X18, X19, X21, X22, X23, X24, X25, X26, X27, X28, X29

Note:

1. SOH byte 8 can be set when the Type 6 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern and the SOH #No. 7.

Bit rate	SOH #No.	Setting range
52 M	(Don't care)	A1,A2,C1,E1,F1
Except above	#01	A1,A2,C1,X18,X19 X22,X23,E1,X25,X26,F1,X28,X29
	Except above	A1,A2,C1,X18,X19 X21,X22,X23,X24,X25,X26,X27,X28,X29

OH pattern

Sets the insert pattern to SOH at 9.
The setting range is as follows:

[Setting range]
Bit meas. OFF : Does not insert
PRBS 2^11-1 : Inserts PRBS pattern
PRBS 2^15-1 : Inserts PRBS pattern
External : Inserts external pattern

Note:

1. At Bit meas. OFF, the SOH preset pattern is outputted.
2. External cannot be set at Tracking ON.
   (Tracking setting sees section 5.17.4)

5. 6. 4 Alarm addition

The alarm addition items are set here.

[Setting items] The following items can be set.

OFF
LOS : Loss Of Signal
OOF : Out Of Frame
LOF : Loss Of Frame
OH alarm
Frame shift

Alarm add

[Operation screen] The settings can be performed on the following screen.

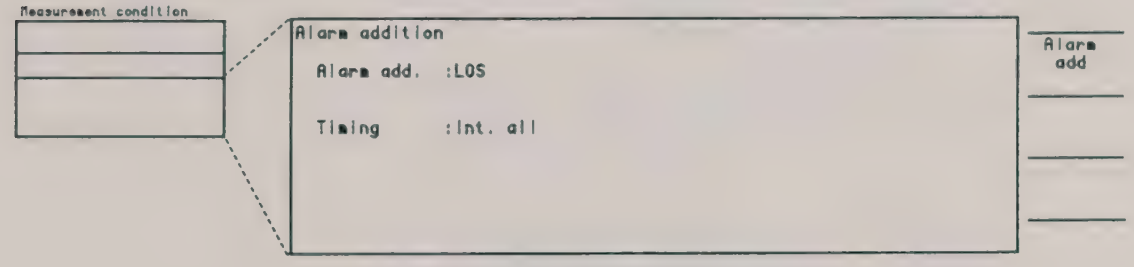


Fig. 5.6-7 Alarm addition screen

Note: When the function key 'Alarm add' is OFF, the set alarm item is not enabled.

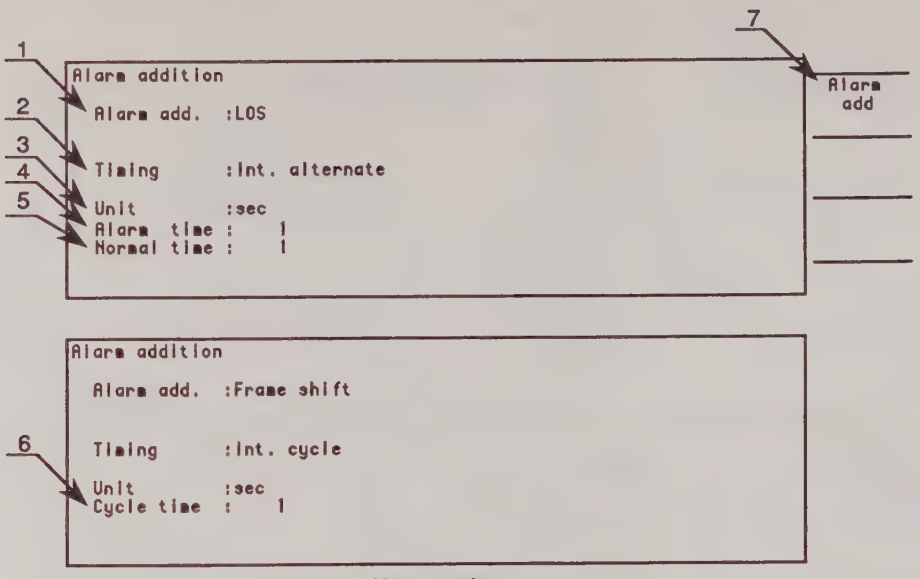


Fig. 5.6-8 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not alarm addition
LOS	: Sets output signal interrupt
OOF	: Frame sync loss
LOF	: Frame sync loss
OH alarm	: Alarm pattern set to arbitrary byte in OH
Frame shift	: 1bit shift

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range]

Int. single
Int. cycle
Int. all
Int. alternate
Ext. gate

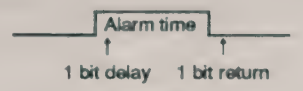
Note: Setting range has following restrictions according to the Alarm add. 1.

Alarm add.	Setting range				
	Int. single	Int. cycle	Int. all	Int. alternate	Ext. gate
Frame shift	○	○	×	×	○
Except above	○	×	○	○	○

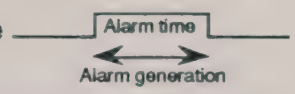
○ : Settable

■Control signal

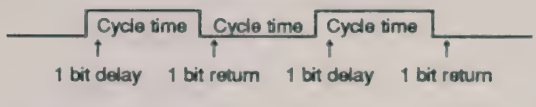
Int. single — Frame shift



Except above

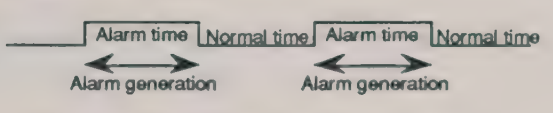


Int. cycle



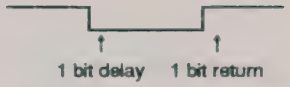
Int. all — Adds every frame

Int. alternate

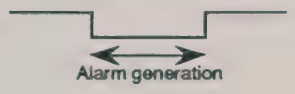


Ext. gate — Adds according to the Input signal from Control Input Alarm/Trigger connector

Frame shift



Except above



Unit — Sets the Unit of addition time at 3.
The setting range is as follows:

[Setting range]
Frame
μsec
msec
sec

Note:

1. Unit 3 can be set when the Timing 2 is Int. single and Int. alternate.
2. Setting range has restrictions accrding to the Alarm add. 1.
(see next page table)

Alarm time

Sets the alarm addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time

Sets the alarm no addition time at 5.
The setting range is as follows:

[Setting range] See following table

Cycle time

Sets the execution time of Frame shift at 6.
The setting range is as follows:

[Setting range] See following table

Alarm add.	Alarm time / Normal time / Cycle time setting range			
	Frame	μsec	msec	sec
LOS	Unsettable	5 ~ 99875 /5	1 ~ 8000 /1	1 ~ 8 /1
OOF	1 ~ 23 /1	125 ~ 2875 /125	1 ~ 2 /2	Unsettable
LOF	24 ~ 40000 /1	Unsettable	3 ~ 8000 /1	1 ~ 8 /1
OH alarm	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Frame shift				

Alarm add

Controls the execution of Alarm addtion by using 'Alarm add' function key at 7.
The setting range is as follows:

[Setting range] Alarm add OFF : Does not add alarm
Alarm add ON : Adds alarm

Note:

1. The Alarm add 7 is disable when Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with the Timing 2. In addition, the LED of alarm item being added light on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' functionkey label is released from the reverse-display and the alarm is not added. In addition, the LED of alarm item being added go off on the front panel alarm section.

● OOF/LOF

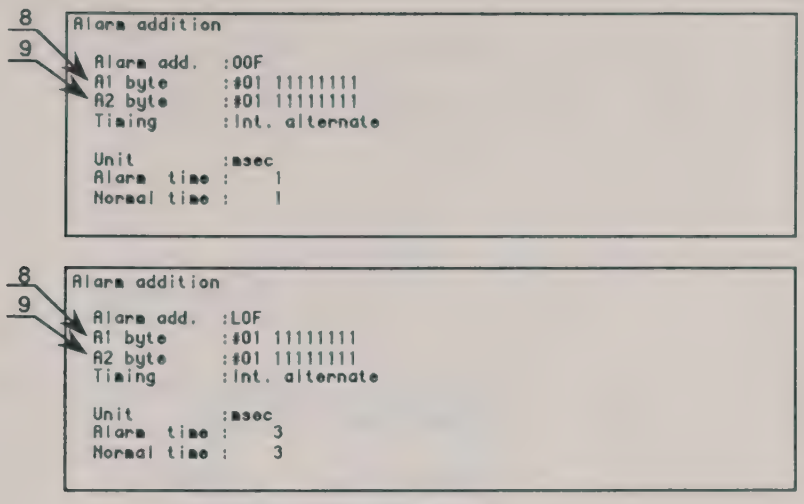


Fig. 5.6-9 OOF/LOF settings

A1 byte
A2 byte

Sets the byte position and alarm pattern of A1/A2 byte at 8 and 9.
The setting range is as follows:

[Setting range]

◆Byte position
#01 ～ #48 ／ step 1
◆Pattern
00000000 ～ 11111111
／bit-pattern settings

Note: Setting range of byte position has following restrictions accrding to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01 ～ #03
622 M	#01 ～ #12
2488 M	#01 ～ #48

● OH alarm

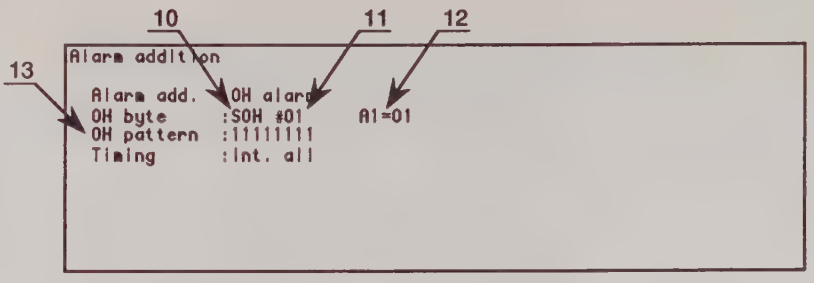


Fig. 5.6-10 OH alarm settings

Type — Sets the type of OH performed alarm addition at 10.
The setting range is as follows:

[Setting range] SOH

SOH #No. — Sets the SOH No. performed alarm addition at 11.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note: Setting range has following restrictions according to the Bit rate of Route setting.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

SOH byte — Sets the SOH byte performed alarm addition at 12.
The setting range is as follows:

[Setting range] A1, A2, C1, E1, F1, X18, X19, X21, X22, X23, X24, X25, X26, X27, X28, X29

Note: Setting range has following restrictions according to the Bit rate of generated pattern and SOH #No. 11.

Bit rate	SOH #No.	Setting range
52 M	(Don't care)	A1,A2,C1,E1,F1
Except above	#01	A1,A2,C1,X18,X19 X22,X23,E1,X25,X26,F1,X28,X29
	Except above	A1,A2,C1,X18,X19 X21,X22,X23,X24,X25,X26,X27,X28,X29

OH pattern

Sets the alarm pattern at 13.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 ／bit-pattern settings

5. 6. 5 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF

All area : Bit all

PRBS pattern inserted in OH : Bit OH PRBS

Bit error add

[Operation screen] The settings can be performed on the following screen.

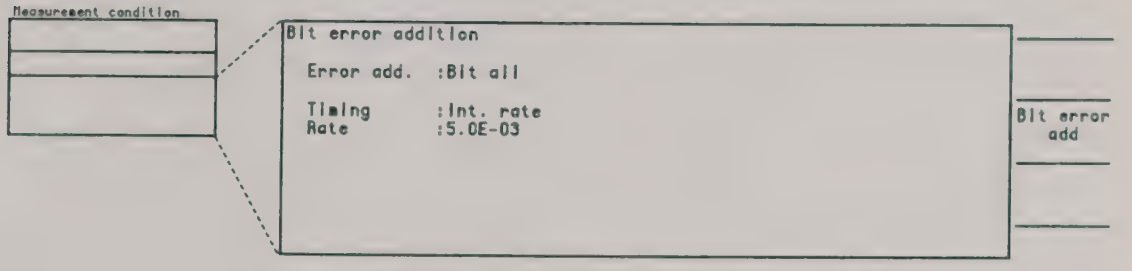


Fig. 5.6-11 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

[Related items] The following item is affected.

Test pattern : OH pattern

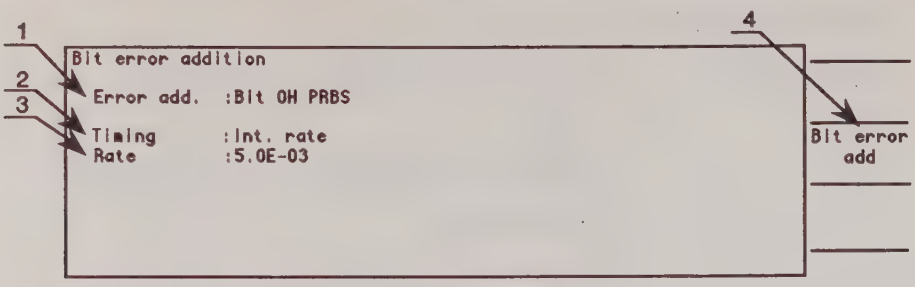


Fig. 5.6-12 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range]
- OFF : Does not add error
- Bit all : Adds error all areas of signal
- Bit OH PRBS : Adds error PRBS area inserted in OH

Note: Bit OH PRBS can be set when the OH pattern of test pattern is PRBS pattern.

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range]
- Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
- Int. rate : Adds error according to error rate
- Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range]
- 5.0E-03
- 1.0E-03
- 1.0E-04
- 1.0E-05
- 1.0E-06
- 1.0E-07
- 1.0E-08
- 1.0E-09
- 1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 5 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 3. In addition, the LED of error item being added (Bit or OH bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 6. 6 Parity／FEBE error addition

The Parity／FEBE error addition item is set here.

[Setting items] The following item can be set.

OFF
Parity B1

Parity/FEBE error add

[Operation screen] The settings can be performed on the following screen.

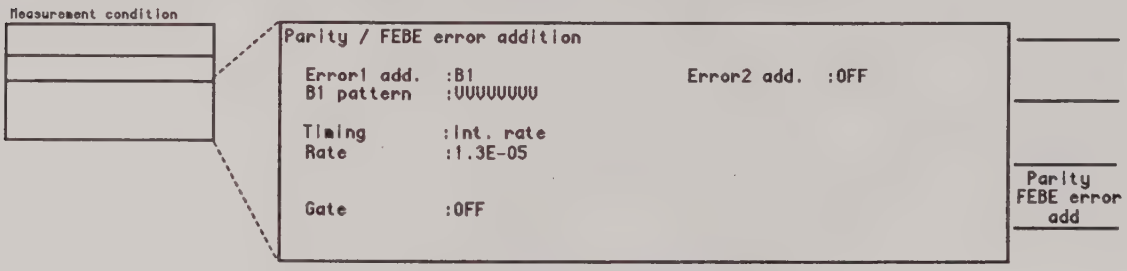


Fig. 5.6-13 Parity／FEBE error addition screen

Note:

1. FEBE error cannot be set.
2. Error 2 is fixed to OFF.
3. The set error item is not enabled when the 'Parity/FEBE error add' function key is disabled.

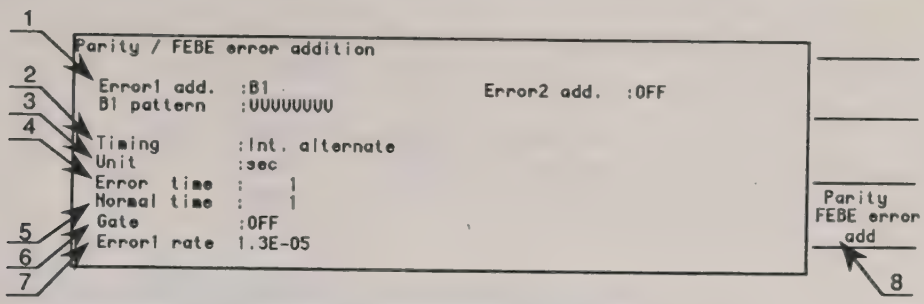


Fig. 5.6-14 Parity/FEBE error settings

Error1 add. sets the error addition item at 1.
The setting range is as follows:

[Setting range] OFF : Does not add error
B1 : Adds error arbitrary bit in B1

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range] Int. single
Int. all
Int. rate
Int. alternate
Ext. single

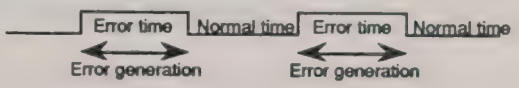
■Control signal

Int. single When Parity/FEBE error add 10 is OFF→ON, adds 1 frame

Int. all Adds every frame

Int. rate Adds used to set error rate

Int. alternate



Ext. single Adds 1 frame at falling edge of input signal from Control Input Error connector

Unit — Sets the unit of addition time at 3.
The setting range is as follows:

[Setting range] Frame
μsec
msec
sec

Note: Unit 3 can be set when the Timing 2 is Int. alternate.

Error time — Sets the error addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time — Sets the error no addition time at 5.
The setting range is as follows:

[Setting range] See following able

Unit	Error time / Normal time Setting range
Frame	1 ~ 40000 /step 1
μsec	125 ~ 99875 /step 125
msec	1 ~ 8000 /step 1
sec	1 ~ 8 /step 1

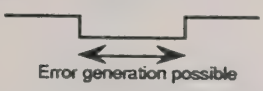
Note: Error time 4 and Normal time 5 can be set when the Timing 2 is Int. alternate.

Gate

Sets the error control according to external signal at 6.
The setting range is as follows:

[Setting range] OFF : Does not external control
External : Adds error while the input signal from Control Input Error connector is Low level

■Control signal
External



Note:

Gate 6 can be set when the Timing 2 is Int. all, Int. rate or Int. alternate.

Error1 rate

Displays the added rate at 7.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:

1. Error1 rate 7 is displayed when the Timing 2 is Int. alternate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Parity/FEBE error add

Controls the execution of Parity/FEBE error addition by using the 'Parity/FEBE error add' function key at 8.
The setting range is as follows:

[Setting range] Parity/FEBE error add OFF : Does not add
Parity/FEBE error add ON : Adds error

Note:

1. The Parity/FEBE error add 8 is disable when the Error1 add. 1 is OFF.
2. When the Parity/FEBE error add is ON, The 'Parity/FEBE error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of Parity/FEBE error item being added light on the front panel error section.
3. When the Parity/FEBE error add is OFF, the 'Parity/FEBE error add' function key label is released from the reverse-display and the errors are not added. In addition, the LED of Parity/FEBE error item being added go off on the front panel error section.

● B1

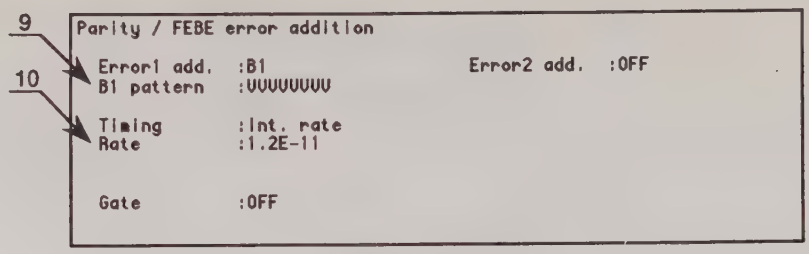


Fig. 5.6-15 B1 settings

B1 pattern — Sets the added pattern at 9.
The setting range is as follows:

[setting range] ＊＊＊＊＊＊＊＊ ～ VVVVVVVV
＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 10.
The setting range is as follows:

[Setting range] 1.5E-12 ～ 6.2E-04

Note:

1. Rate 10 can be set when the Timing 2 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B1 pattern 9. (see table 5.4-1)

5. 6. 7 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source
- OFF
- Alarm／APS test
- Bit error
- Parity／FEBE error
- Frame pulse
- Cons. 0／1
- SOH／POH

[Operation screen] The settings can be performed on the following screen.

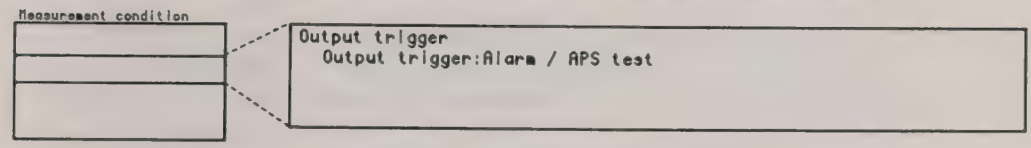


Fig. 5.6-16 Trigger output setting screen

[Related items] The following item is affected.

Test pattern : 0／1 consecutive pattern

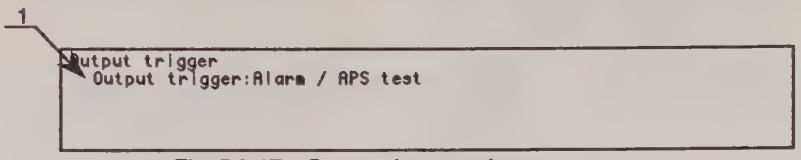


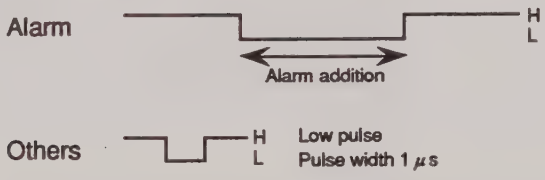
Fig. 5.6-17 Output trigger settings

Output trigger Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Alarm / APS test	: Outputs at alarm addition time
Bit error	: Outputs at Bit error addition time
Parity / FEBE error	: Outputs at Parity/FEBE error addition time
Frame pulse	: Outputs at SOH 1 row generation time
Cons. 0/1	: Outputs at 0/1 consecutive signal generation time
SOH / POH	: Outputs at SOH/POH specified 1 byte

■Trigger signal



注意 Cons. 0/1 cannot be set when the Cons. 0/1 of test pattern is unsettable or OFF.

● SOH／POH

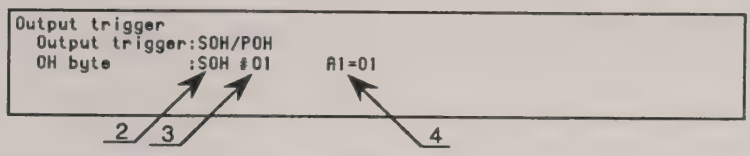


Fig. 5.6-18 SOH/POH settings

Type Sets the type of trigger output OH at 2.
The setting range is as follows:

[Setting range] SOH

Note: Type 2 can be set when the Output trigger 1 is SOH/POH.

SOH #No. Sets the trigger output SOH No. at 3.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note: Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

SOH byte Sets the byte of trigger output SOH at 4.
The setting range is as follows:

[Setting range] A1, A2, C1, E1, F1, X18, X19, X21, X22, X23, X24, X25, X26, X27, X28, X29

Note: Setting range has following restrictions according to the Bit rate of generated pattern and SOH #No. 3.

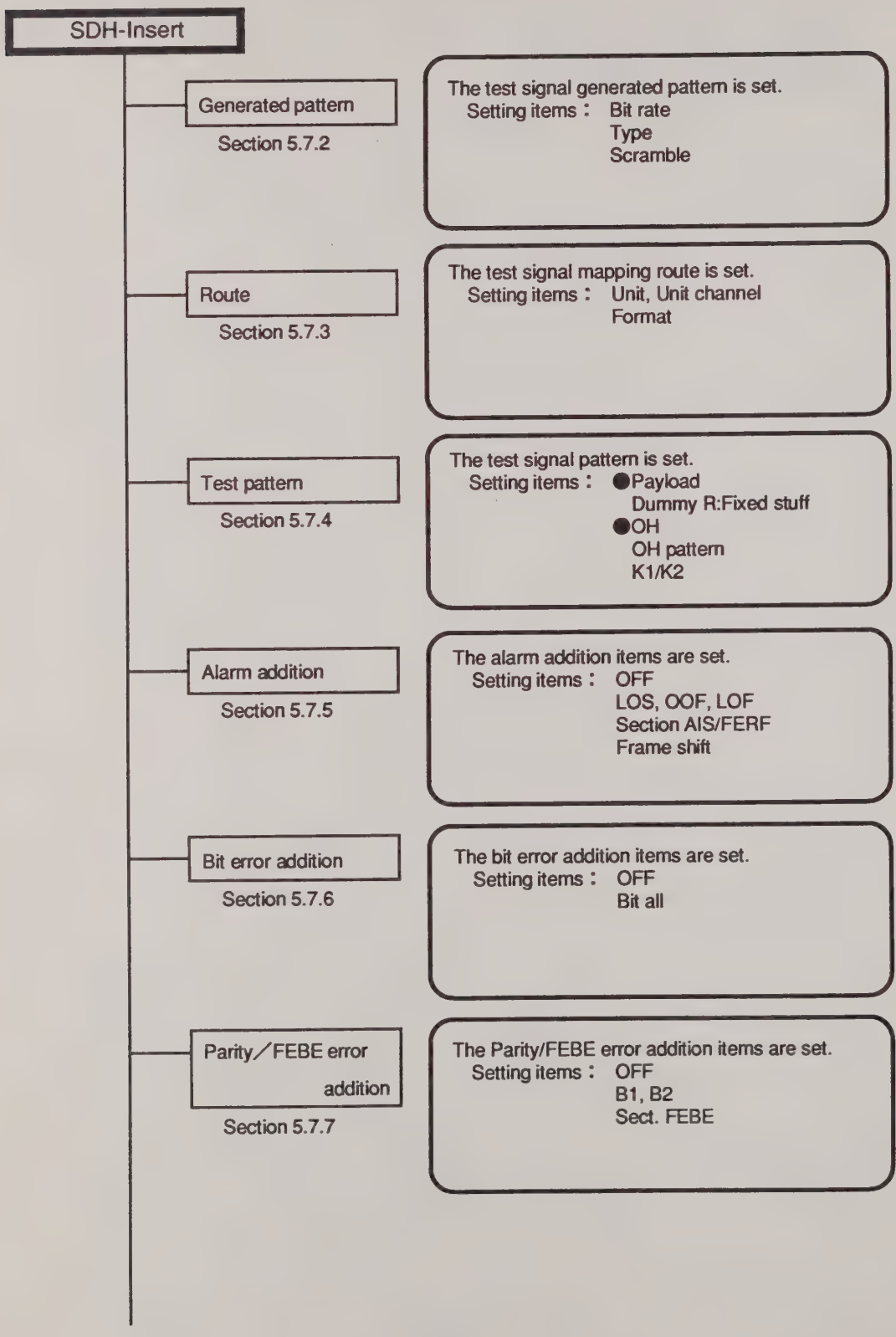
Bit rate	SOH #No.	Setting range
52 M	(Don't care)	A1,A2,C1,E1,F1
Except above	#01	A1,A2,C1,X18,X19 X22,X23,E1,X25,X26,F1,X28,X29
	Except above	A1,A2,C1,X18,X19 X21,X22,X23,X24,X25,X26,X27,X28,X29

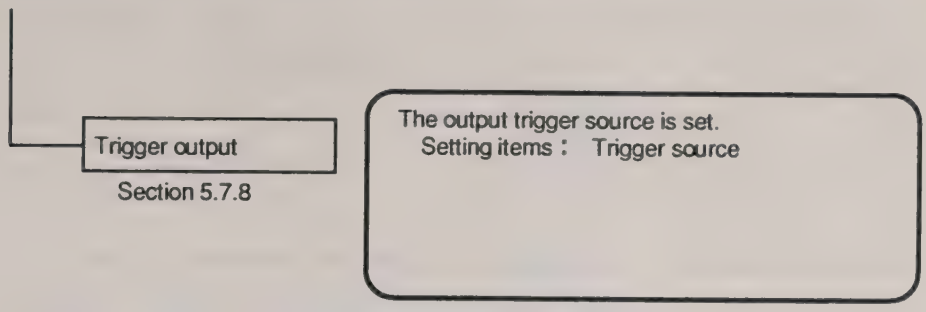
5. 7 Setting SDH-Insert

5. 7. 1 List of functions

The external STM0 (52M) or STM1 signal is inserted in any 1 channel of the Internally-generated signal and output.

The SDH-Insert functions are listed below.


SDH-Insert
Generated pattern
Section 5.7.2
The test signal generated pattern is set.
Setting items : Bit rate
Type
Scramble
Route
Section 5.7.3
The test signal mapping route is set.
Setting items : Unit, Unit channel
Format
Test pattern
Section 5.7.4
The test signal pattern is set.
Setting items : ●Payload
Dummy R:Fixed stuff
●OH
OH pattern
K1/K2
Alarm addition
Section 5.7.5
The alarm addition items are set.
Setting items : OFF
LOS, OOF, LOF
Section AIS/FERF
Frame shift
Bit error addition
Section 5.7.6
The bit error addition items are set.
Setting items : OFF
Bit all
Parity／FEBE error addition
Section 5.7.7
The Parity/FEBE error addition items are set.
Setting items : OFF
B1, B2
Sect. FEBE


Trigger output
Section 5.7.8
The output trigger source is set.
Setting items : Trigger source

5. 7. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The settings can be performed on the following scree.

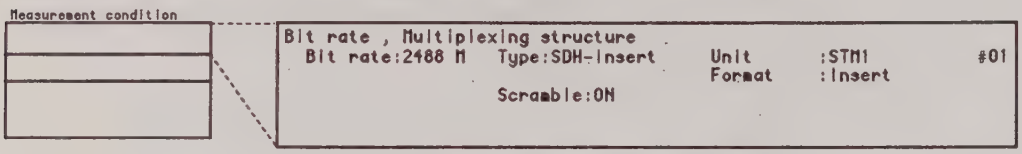


Fig. 5.7-1 Generated pattern setting screen

[Related items] The following item is affected.

Equipment name : ME3520A／ME3620A

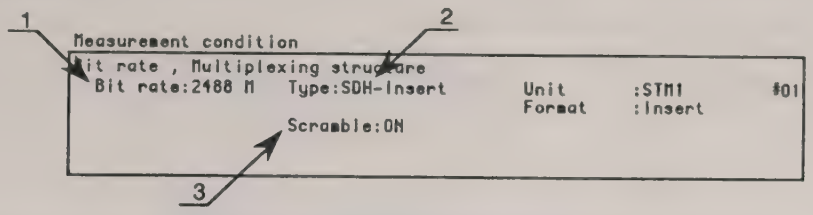


Fig. 5.7-2 Generated pattern settings

Bit rate

Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488 M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings. (→ See section 5.11)

Type

Sets the type of output signal at 2.
The setting range is as follows:

[Setting range] SDH-Insert

Scramble

Sets the Scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 7. 3 Setting route

The test signal mapping route is set here.

[Setting items] The following items can be set.

- Unit and Unit channel
- Format

[Operation screen] The settings can be performed on the following screen.

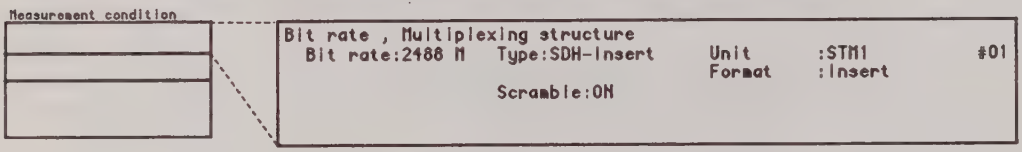


Fig. 5.7-3 Route setting screen

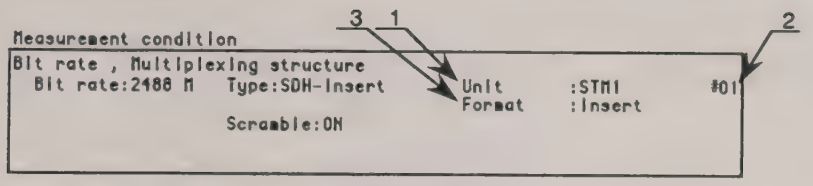


Fig. 5.7-4 Route settings

Unit Sets the Unit size inserted in external signal at 1.
The setting range is as follows:

[Setting range] STM0 (52M)
STM1

Note: When Bit rate of generated pattern is 52M, STM1 cannot be set.

Unit Channel Sets the Channel inserted in external signal at 2.
The setting range is as follows:

[Setting range] #01 ~ #48 / step 1

Note: Setting range has following restrictions according to the Bit rate of generated pattern and Unit 1.

Bit rate	Unit	Setting range
52 M	STM0(52M)	#01
156 M	STM0(52M)	#01 ~ #03
	STM1	#01
622 M	STM0(52M)	#01 ~ #12
	STM1	#01 ~ #04
2488 M	STM0(52M)	#01 ~ #48
	STM1	#01 ~ #16

Format Sets the Format of Unit at 3.
The setting range is as follows:

[Setting range] Insert

5. 7. 4 Setting test pattern

The test signal pattern set here.

[Setting items] The following items can be set.

- Payload settings
  Dummy, R:Fixed stuff
- OH settings
  SOH/POH Preset pattern
  SOH/POH pattern K1/K2
  Insert SOH

[Operation screen] The settings can be performed on the following screen.

- Payload settings

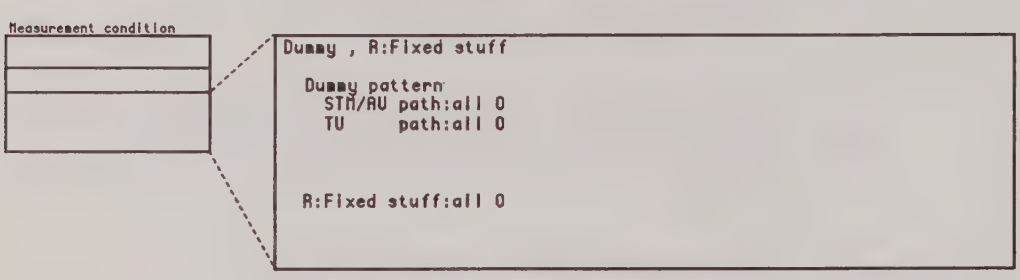


Fig. 5.7-5 Payload setting screen

- OH settings

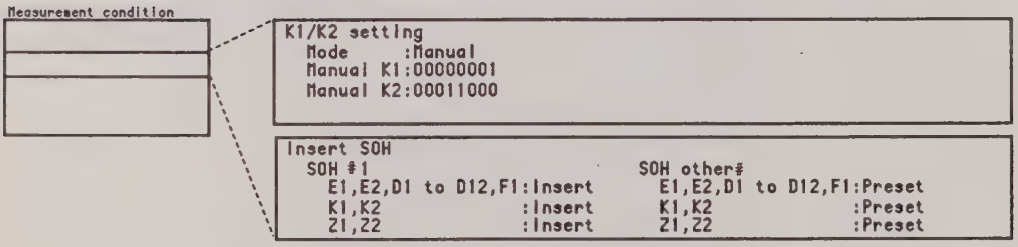


Fig. 5.7-6 OH setting screen

In addition, the following screen is available as pattern setting screen.

- PRGM SOH/POH preset data screen

● Dummy／Stuff pattern

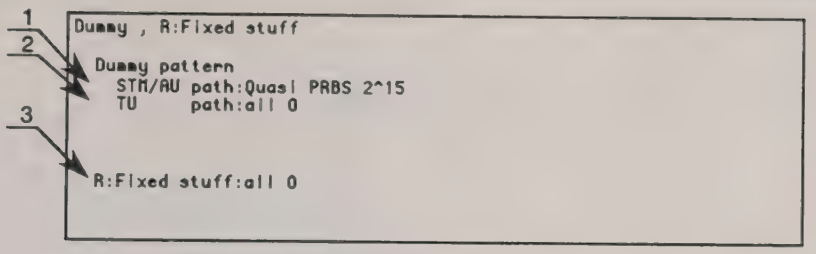


Fig. 5.7-7 Dummy/Stuff settings

STM／AU path

Sets the channel pattern of except Insert channel in STM／AU path at 1.
The setting range is as follows:

[Setting range] all 0
all 1
Quasi PRBS 2^15

TU path

Sets the channel pattern of except Insert channel in TU path at 2.
The setting range is as follows:

[Setting range] all 0
all 1

Note: TU path can be set when electrical option-25 or 26 is mounted.

R : Stuff

Sets the Stuff bit pattern inserted into payload at 3.
The setting range is as follows:

[Setting range] all 0
all 1

● SOH/POH preset pattern

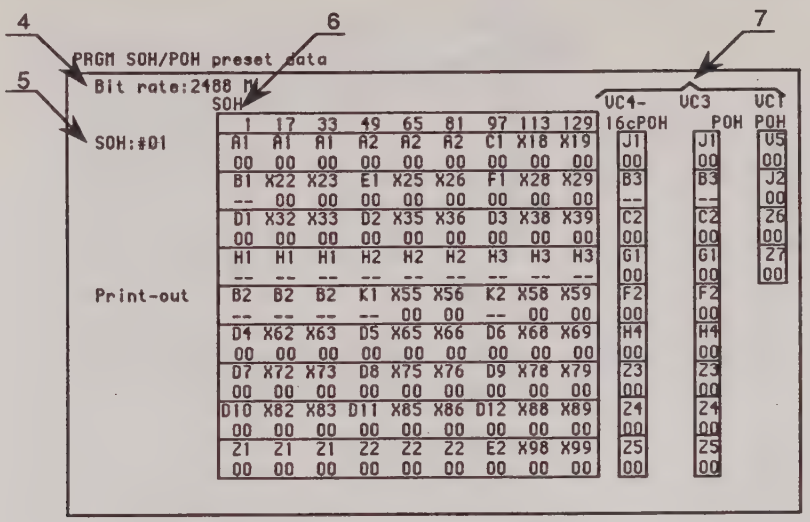


Fig. 5.7-8 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 4.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. The pattern setting is possible for arbitrary Bit rate, but the output data with the same Bit rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 5.
The setting range is as follows:

[Setting range] #01 ~ #16 / step 1

Note: Setting range has following restrictions according to the Bit rate 4.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04
2488 M	#01 ~ #16

SOH pattern

Sets the SOH preset pattern at 6.
The setting range is as follows:

[Setting range] All bytes except K1/K2, H1/H2/H3, B1 and B2

POH pattern

Sets the POH preset pattern at 7.
The setting range is as follows:

[Setting range]
◆VC4, VC4-4c, VC4-16c
All bytes except B3
◆VC3
All bytes except B3

Note:

1. VC1 POH can be set when electrical option-25 or 26 is installed, but it is not outputted.
2. VC4 POH label is changed as follows according to the Bit rate 4.

Bit rate	POH lavel
52 M	Not display
156 M	VC4 POH
622 M	VC4-4c POH
2488 M	VC4-16c POH

3. The outputted POH pattern is as follows according to the Unit of route setting.

Unit	POH output pattern		
	VC4	VC3	VC1
STM0(52M)	×	○	×
STM1	○	×	×

○ : Outputable

● SOH/POH pattern

◆K1/K2

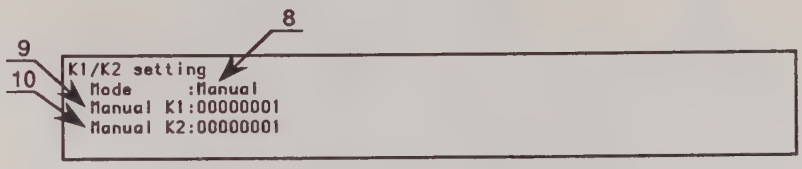


Fig. 5.7-9 K1/K2 pattern settings

Mode Sets the K1/K2 setting mode at 8.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting

Manual K1
Manual K2 Sets the K1/K2 arbitrary pattern at 9 and 10.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

◆Insert SOH

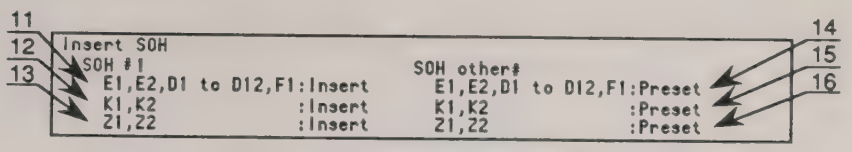


Fig. 5.7-10 Insert SOH settings

SOH #1
E1,E2,D1 to D12,F1
K1, K2
Z1, Z2

Sets the SOH byte pattern when Insert signal is inserted into the Unit channel #1 at 11, 12 and 13.
The setting range is as follows:

[Setting range] Preset : Exchanges the internal pattern and outputs
Insert : Outputs Insert signal pattern

SOH other #
E1,E2,D1 to D12,F1
K1, K2
Z1, Z2

Sets the SOH byte pattern when Insert signal is inserted into except Unit channel #1 at 14, 15 and 16.
The setting range is as follows:

[Setting range] Preset : Outputs internal pattern
Insert : Exchanges Insert signal pattern and outputs

Note:

1. When E1, E2, D1 to D12, F1 or Z1, Z2 is set to Preset, Preset pattern is outputted.
2. When K1, K2 is set to Preset, K1/K2 Manual pattern is outputted.
3. The byte set to insert at SOH other #, exchanges to byte of channel #1.

5. 7. 5 Alarm addition

The alarm addition items are set here.

[Setting items] The following items can be set.

OFF		
LOS	:	Loss Of Signal
OOF	:	Out Of Frame
LOF	:	Loss Of Frame
Sect. AIS	:	Section Alarm Indication Signal
Sect. FERF	:	Section Far End Receive Failure
Frame shift		
Alarm add		

[Operation screen] The settings can be performed on the following screen.

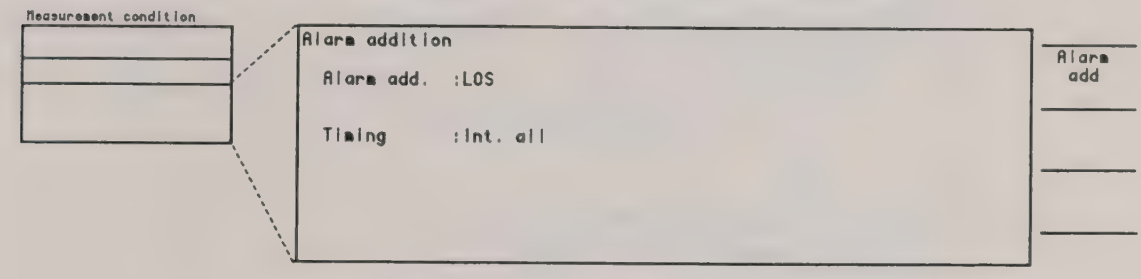


Fig. 5.7-11 Alarm addition screen

Note: When the function key 'Alarm add' is OFF, the set alarm item is not enabled.

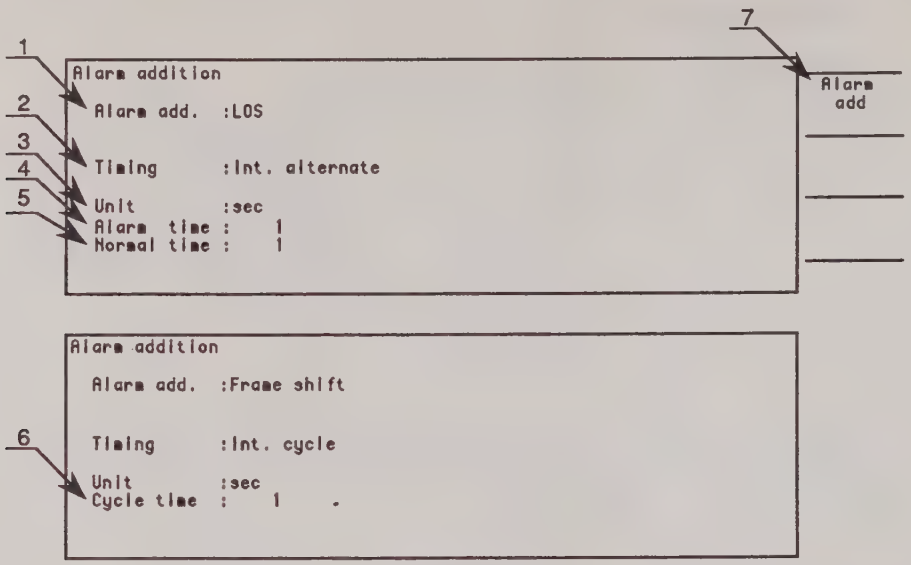


Fig. 5.7-12 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

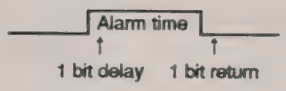
[Setting range]		
	OFF	: Does not alarm addition
	LOS	: Sets output signal interrupt
	OOF	: Frame sync loss
	LOF	: Frame sync loss
	Sect. AIS	: All bits except SOH 1 to 3 row set to all 1s
	Sect. FERF	: K2 b6~b8 set to '110'
	Frame shift	: 1 bit shift

Timing Sets the addition timing at 2.
The setting range is as follows:

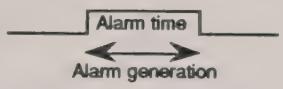
[Setting range]
Int. single
Int. cycle
Int. all
Int. alternate
Ext. gate

■Control signal

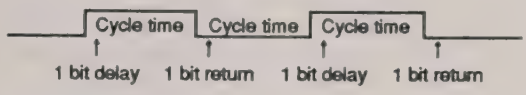
Int. single — Frame shift



Except above

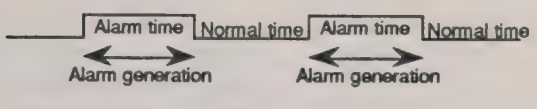


Int. cycle



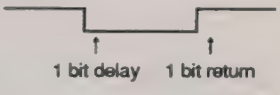
Int. all — Adds every frame

Int. alternate

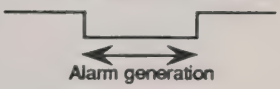


Ext. gate — Adds according to the Input signal from Control Input Alarm/Trigger connector

Frame shift



Except above



Note: Setting range has following restrictions according to the Alarm add. 1.

Alarm add.	Setting range				
	Int. single	Int. cycle	Int. all	Int. alternate	Ext. gate
Frame shift	○	○	×	×	○
Except above	○	×	○	○	○

○ : Settable

Unit — Sets the Unit of addition time at 3.
The setting range is as follows:

[Setting range] Frame
μsec
msec
sec

Note:
1. Unit 3 can be set when the Timing 2 is Int. single or Int. alternate.
2. Setting range has restrictions according to the Alarm add. 1. (see next page table)

Alarm time

Sets the alarm addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time

Sets the alarm no addition time at 5.
The setting range is as follows:

[Setting range] See following table

Cycle time

Sets the execution time of Frame shift at 6.
The setting range is as follows:

[Setting range] See following table

Alarm add.	Alarm time / Normal time / Cycle time Setting range			
	Frame	μsec	msec	sec
LOS	Unsettable	5 ~ 99875 /5	1 ~ 8000 /1	1 ~ 8 /1
OOF	1 ~ 23 /1	125 ~ 2875 /125	1 ~ 2 /2	Unsettable
LOF	24 ~ 40000 /1	Unsettable	3 ~ 8000 /1	1 ~ 8 /1
Sect. AIS	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Sect. FERF				
Frame shift				

Alarm add

Controls the execution of Alarm addition by using 'Alarm add' function key at 7.
The setting range is as follows:

[Setting range] Alarm add OFF : Does no add alarm
Alarm add ON : Adds alarm

Note:

1. The Alarm add 7 is disable when the Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with the Timing 2. In addition, the LED of alarm item being added light on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' function key label is released from the reverse-display and the alarm is not added. In addition, the LED of alarm item being added go off on the front panel alarm section.

● OOF/LOF

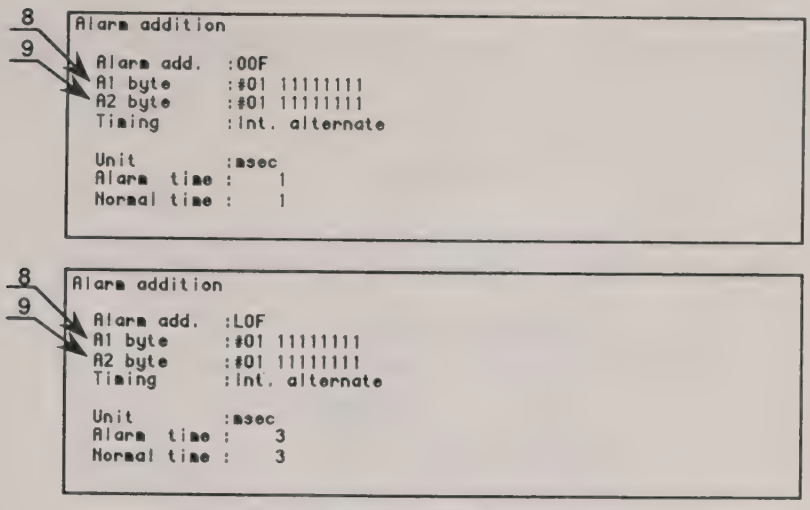


Fig. 5.7-13 OOF/LOF settings

A1 byte
A2 byte

Sets the byte position and alarm pattern of A1/A2 byte at 8 and 9.
The setting range is as follows:

[Setting range]
◆Byte position
#01 ～ #48 ／ step 1
◆Pattern
00000000 ～ 11111111
／ bit-pattern settings

Note: Setting range of byte position has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01 ～ #03
622 M	#01 ～ #12
2488 M	#01 ～ #48

5. 7. 6 Bit error addition

The bit error addition item is set here.

[Setting items] There are following items because addition area.

OFF

All areas : Bit all

Bit error add

[Operation screen] The settings can be performed on the following screen.

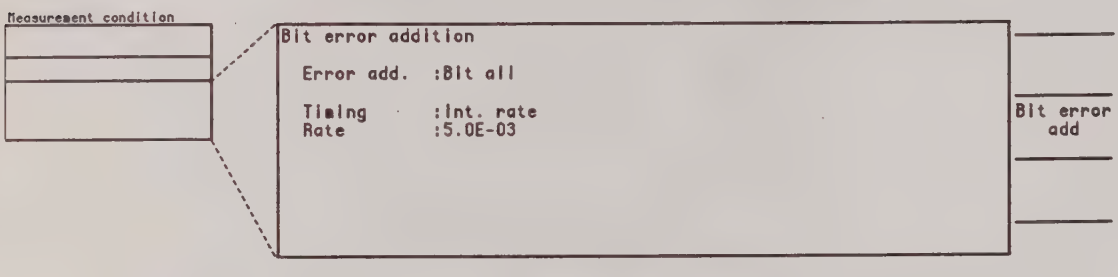


Fig. 5.7-14 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

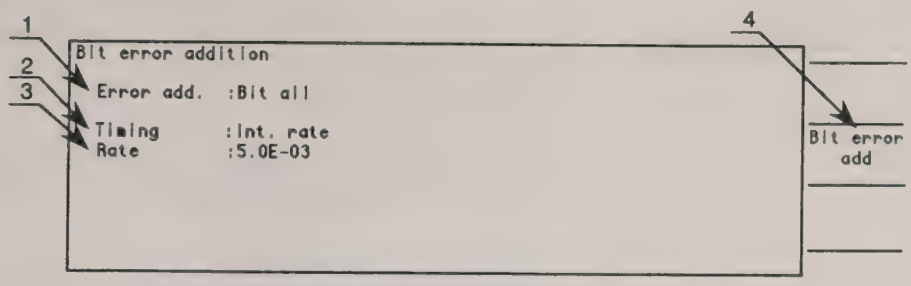


Fig. 5.7-15 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range] OFF : Does not add error
Bit all : Adds error all areas of signal

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range] Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
Int. rate : Adds error according to error rate
Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range] 5.0E-03
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
1.0E-09
1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 4 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of error item being added (Bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 7. 7 Parity／FEBE error addition

The Parity／FEBE error addition items are set here.

[Setting items] The following items can be set.

OFF
Parity B1
B2
FEBE Sect. FEBE : Section Far End Block Error

Parity/FEBE error add

[Operation screen] The settings can be performed on the following screen.

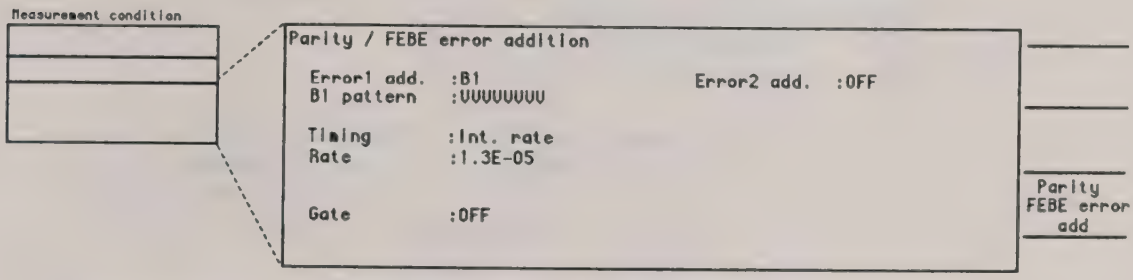


Fig. 5.7-16 Parity／FEBE error addition screen

Note:

1. Two types of error: Error1 and Error2 can be set simultaneously but the Error2 addition timing is performed at the Error1 set timing.
2. The set error items are not enabled when the 'Parity/FEBE error add' function key is disabled.

[Related items] The following items are affected.

Generated pattern : Bit rate
Route setting : Unit

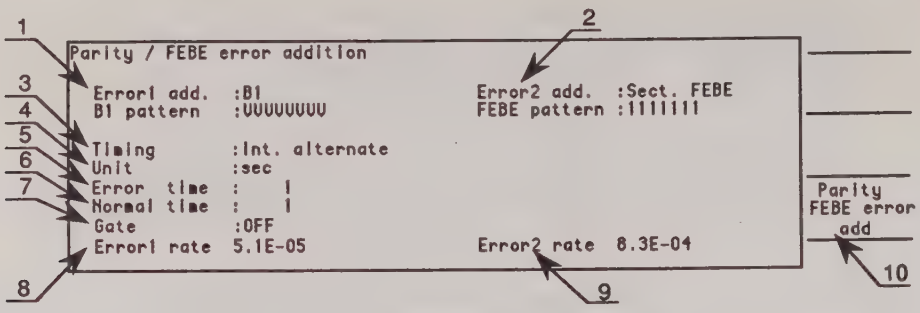


Fig. 5.7-17 Parity/FEBE error settings

Error1 add.
Error2 add.

Sets the error addition items at 1 and 2.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
B1	: Adds error arbitrary bit in B1
B2	: Adds error arbitrary bit in B2
Sect. FEBE	: Sets pattern to Z2 b2~b8

Note:

1. The error addition cannot be performed when the Error1 add. 1 is OFF.
2. The same item cannot be set at the Error1 add. 1 and the Error2 add. 2 except at OFF.
3. Sect. FEBE can be set under the following conditions.

Bit rate	Unit
52 M	STM0 (52M)
156 M	STM1
Except above	Unsettable

Timing

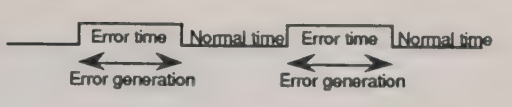
Sets the addition timing at 3.
The setting range is as follows:

[Setting range]

- Int. single
- Int. all
- Int. rate
- Int. alternate
- Ext. single

Note: The addition timing of Error2 add. 2 is same as the Error1 add. 1.

■Control signal

Int. single	When Parity/FEBE error add 10 is OFF→ON, adds 1 frame
Int. all	Adds every frame
Int. rate	Adds used to set error rate
Int. alternate	
Ext. single	Adds 1 frame at falling edge of input signal from Control Input Error connector

Unit

Sets the Unit of addition time at 4.
The setting range is as follows:

[Setting range] Frame
μsec
msec
sec

Error time

Sets the error addition time at 5.
The setting range is as follows:

[Setting range]
◆Frame
1 ~ 40000 / step 1
◆μsec
125 ~ 99875 / step 125
◆msec
1 ~ 8000 / step 1
◆sec
1 ~ 8 / step 1

Normal time

Sets the error no addition time at 6.
The setting range is as follows:

[Setting range] Same as Error time 5

Note:

Unit 4, Error time 5 and Normal time 6 can be set when the Timing 3 is Int. alternate.

Gate — Sets the error control according to external signal at 7.
The setting range is as follows:

[Setting range] OFF : Does not external control
External : Adds error while the input signal from Control Input Error connector is Low level.

■Control signal
External

Note: Gate 7 can be set when the Timing 3 is Int. all, Int. rate or Int. alternate.

Error1 rate — Displays the added rate at 8.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:
1. Error1 rate 8 is displayed when the Timing 3 is Int. alternate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Error2 rate — Displays the added rate at 9.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:
1. Error2 rate 9 is displayed when the Timing 3 is Int. alternate or Int. rate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Parity/FEBE error add

Controls the execution of Parity/FEBE error addition by using the 'Parity/FEBE error add' function key at 10.
The setting range is as follows:

[Setting range] Parity/FEBE error add OFF : Does not add
Parity/FEBE error add ON : Adds error

Note:

1. The Parity/FEBE error add 10 is disable when the Error1 add. 1 is OFF.
2. When the Parity/FEBE error add is ON, The 'Parity/FEBE error add' function key label is reverse-displayed and the error items being set are added in accordance with the Timing 3. In addition, the LEDs of Parity/FEBE error items being added light on the front panel error section.
3. When the Parity/FEBE error add is OFF, the 'Parity/FEBE error add' function key label is released from the reverse-display and the errors are not added. In addition, the LEDs of Parity/FEBE error items being added go off on the front panel error section.

● B1

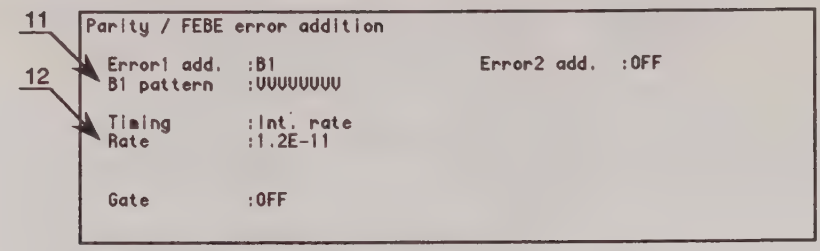


Fig. 5.7-18 B1 settings

B1 pattern — Sets the added pattern at 11.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ VVVVVVVV
＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 12.
The setting range is as follows:

[Setting range] 1.5E-12 ～ 6.2E-04

Note:

1. Rate 12 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B1 pattern 11. (see table 5.4-1)

● B2

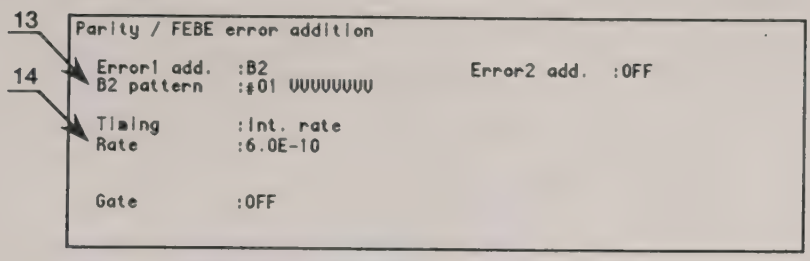


Fig. 5.7-19 B2 settings

B2 pattern

Sets the byte position and added pattern at 13.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ～ #48 ／ step 1
◆Pattern
＊＊＊＊＊＊＊＊ ～ VVVVVVVV
＊ : Does not add
V : Adds pattern

Note:

Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range	
	Byte position	Pattern
52 M	#01	Total 8 bits ＊／V
156 M	#01 ～ #03	Total 24 bits ＊／V
622 M	#01 ～ #12	Total 96 bits ＊／V
2488 M	#01 ～ #48	Total 348 bits ＊／V

Rate

Sets the added rate at 14.
The setting range is as follows:

[Setting range] 1.6E-12 ～ 6.2E-04

Note:

1. Rate 14 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B2 pattern 13. (see table 5.4-1)

● Section FEBE

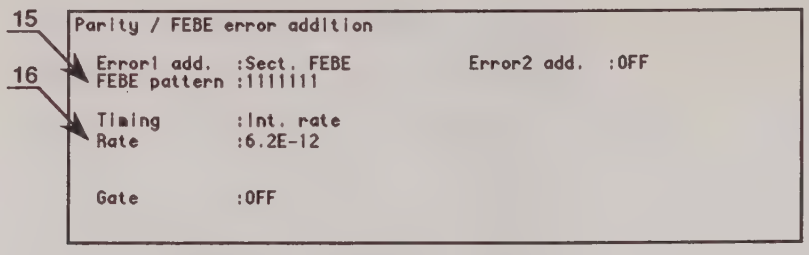


Fig. 5.7-20 Section FEBE settings

FEBE pattern — Sets the added pattern at 15.
The setting range is as follows:

[Setting range] 0000000 ~ 1111111 / bit-pattern settings

Rate — Sets the added rate at 16.
The setting range is as follows:

[Setting range] 6.2E-12 ~ 9.9E-03

Note:

1. Rate 16 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the FEBE pattern 15. (see table 5.4-1)

5. 7. 8 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source	OFF
	Alarm／APS test
	Bit error
	Parity／FEBE error
	Frame pulse
	SOH／POH

[Operation screen] The settings can be performed on the following screen.

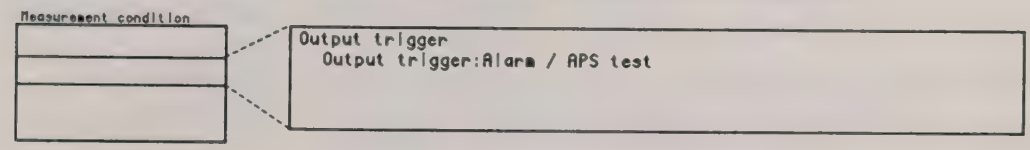


Fig. 5.7-21 Trigger output setting screen

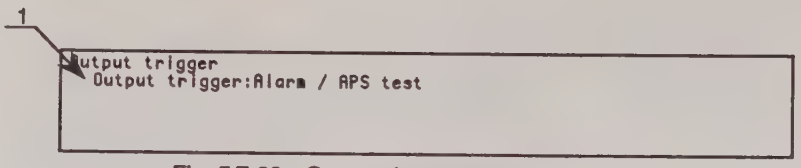


Fig. 5.7-22 Output trigger settings

Output trigger

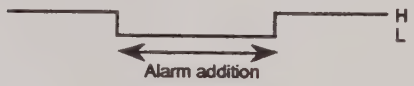
Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Alarm / APS test	: Outputs at alarm addition time
Bit error	: Outputs at Bit error addition time
Parity / FEBE error	: Outputs at Parity/FEBE error addition time
Frame pulse	: Outputs at SOH 1 row generation time
SOH / POH	: Outputs at SOH/POH specified 1 byte

■Trigger source

Alarm / APS test



Others

● SOH／POH

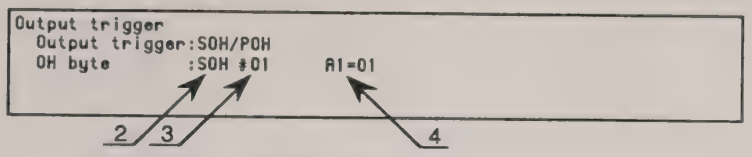


Fig. 5.7-23 SOH/POH settings

Type Sets the type of trigger output OH at 2.
The setting range is as follows:

[Setting range] SOH

Note: Type 2 can be set when the Output trigger 1 is SOH/POH.

SOH #No. Sets the trigger output SOH No. at 3.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note: Setting range has following restrictions according to the Bit rate of generation pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

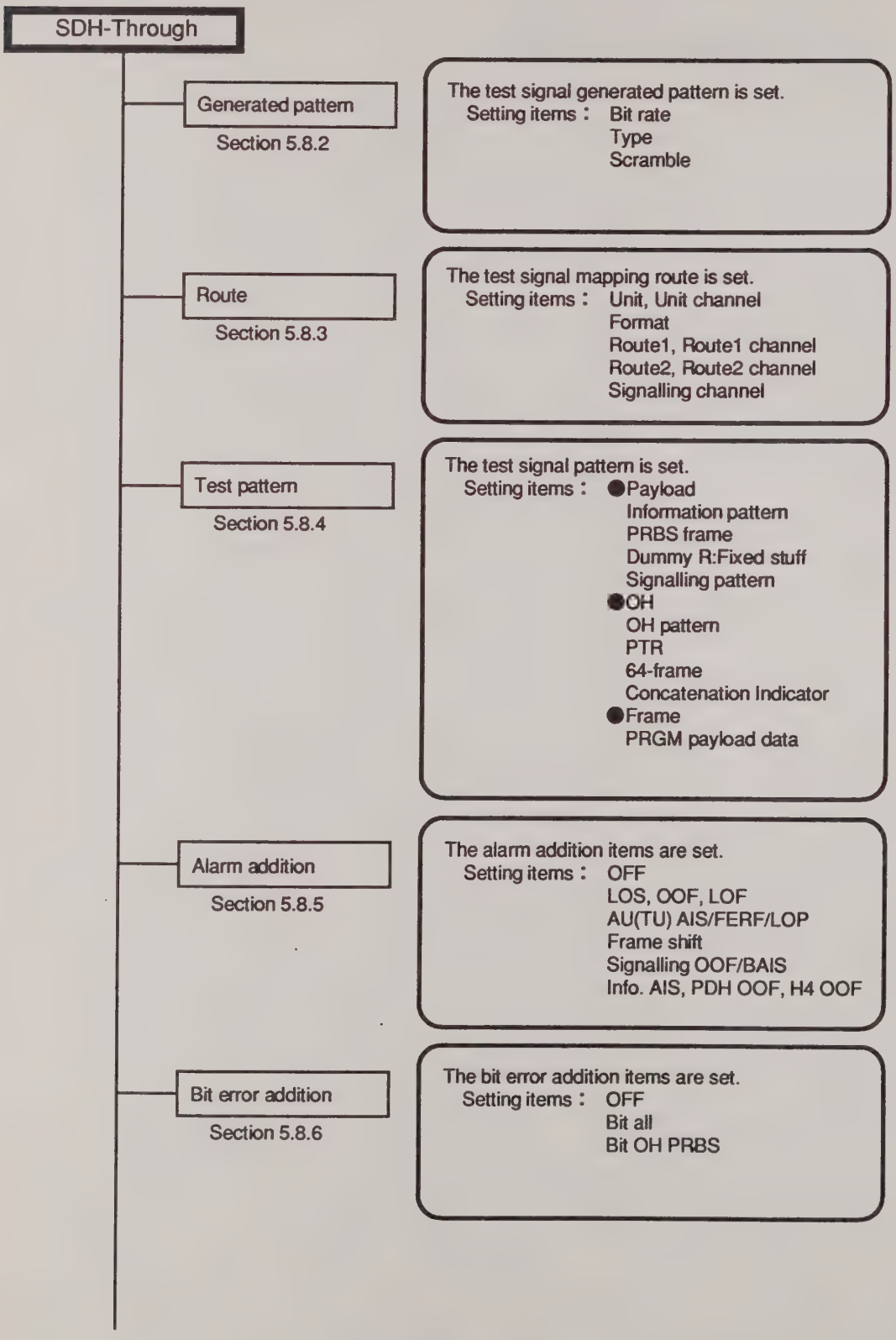
SOH byte Sets the byte of trigger output SOH at 4.
The setting range is as follows:

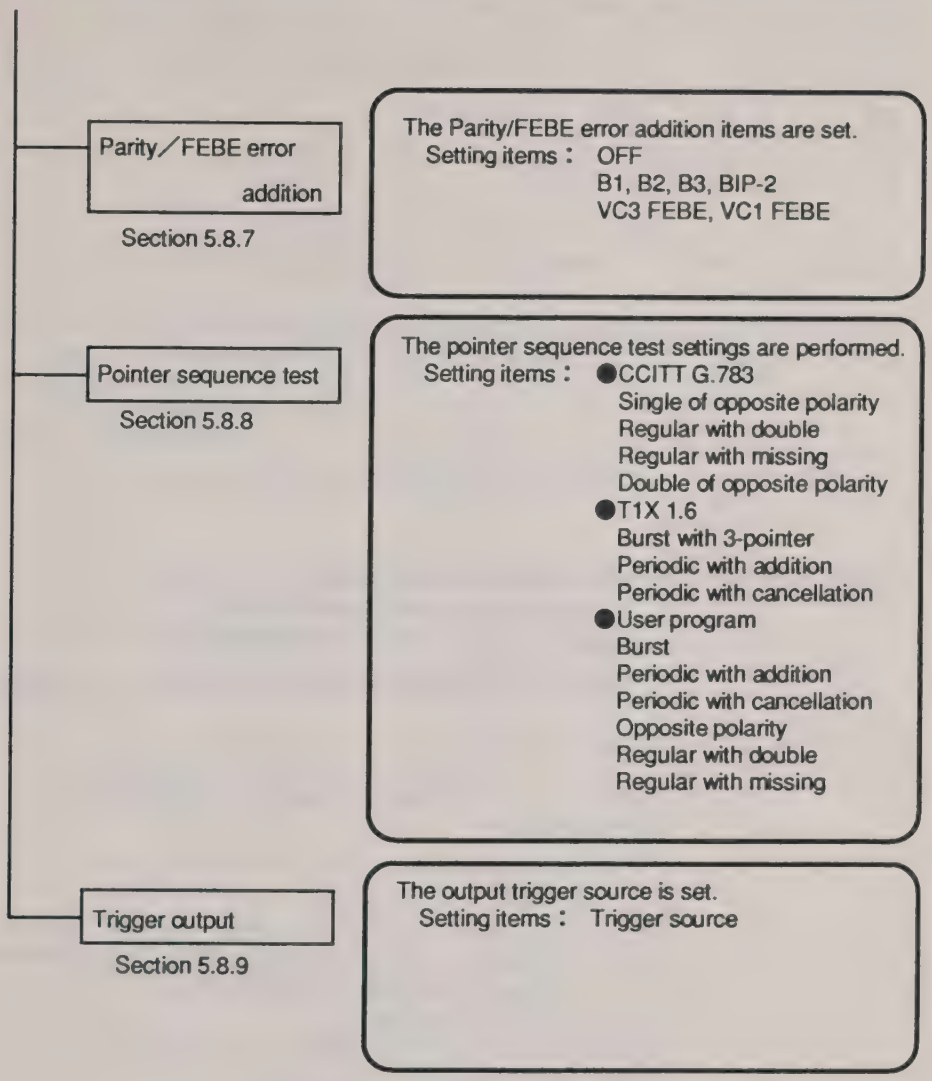
[Setting range] Arbitrary 1 byte

5. 8 Setting SDH-Through

5. 8. 1 List of functions

The input signal is performed through output.
The SDH-Through functions are listed below.


SDH-Through
Generated pattern
Section 5.8.2
The test signal generated pattern is set.
Setting items : Bit rate
Type
Scramble
Route
Section 5.8.3
The test signal mapping route is set.
Setting items : Unit, Unit channel
Format
Route1, Route1 channel
Route2, Route2 channel
Signalling channel
Test pattern
Section 5.8.4
The test signal pattern is set.
Setting items : ●Payload
Information pattern
PRBS frame
Dummy R:Fixed stuff
Signalling pattern
●OH
OH pattern
PTR
64-frame
Concatenation Indicator
●Frame
PRGM payload data
Alarm addition
Section 5.8.5
The alarm addition items are set.
Setting items : OFF
LOS, OOF, LOF
AU(TU) AIS/FERF/LOP
Frame shift
Signalling OOF/BAIS
Info. AIS, PDH OOF, H4 OOF
Bit error addition
Section 5.8.6
The bit error addition items are set.
Setting items : OFF
Bit all
Bit OH PRBS


Parity／FEBE error addition
Section 5.8.7
The Parity/FEBE error addition items are set.
Setting items： OFF
B1, B2, B3, BIP-2
VC3 FEBE, VC1 FEBE
Pointer sequence test
Section 5.8.8
The pointer sequence test settings are performed.
Setting items： ●CCITT G.783
Single of opposite polarity
Regular with double
Regular with missing
Double of opposite polarity
●T1X 1.6
Burst with 3-pointer
Periodic with addition
Periodic with cancellation
●User program
Burst
Periodic with addition
Periodic with cancellation
Opposite polarity
Regular with double
Regular with missing
Trigger output
Section 5.8.9
The output trigger source is set.
Setting items： Trigger source

5. 8. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The settings can be performed on the following screen.

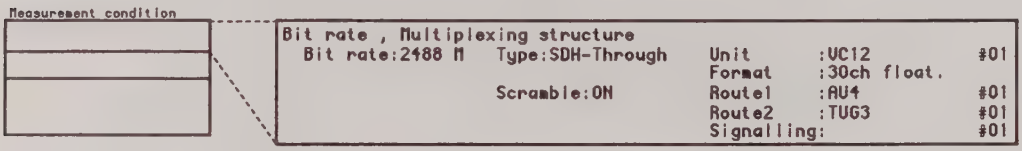


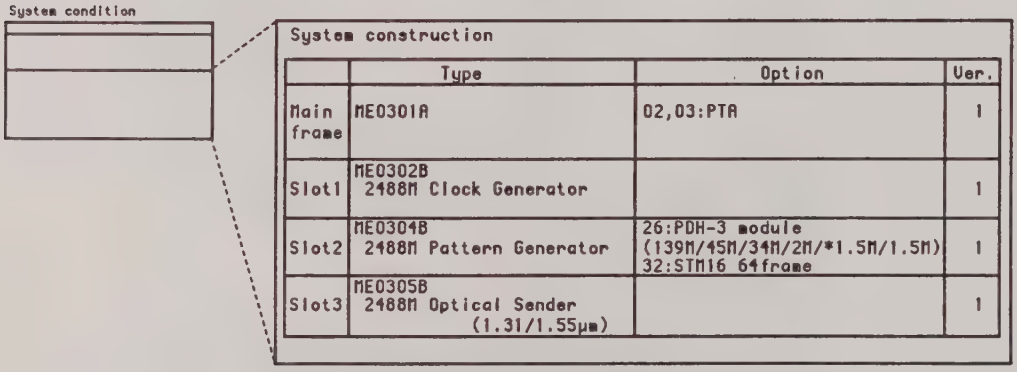
Fig. 5.8-1 Generated pattern setting screen

[Related items] The following items are affected.

Equipment name : ME3520A/ME3620A

Option condition : Presence/absence of Electrical option-25 or 26

However, the option condition can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302B 2488M Clock Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.8-2 Related screen

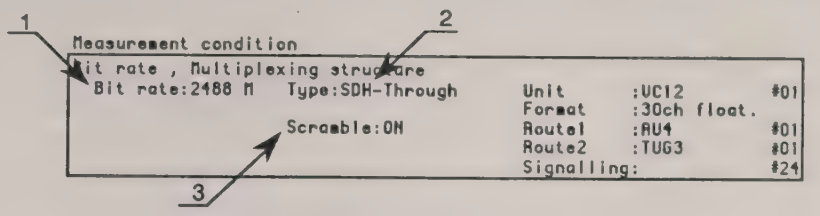


Fig. 5.8-3 Generated pattern settings

Bit rate Sets the Bit rate of output signal at 1 .
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings. (→ See section 5.11)

Type Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range] SDH-Internal

Scramble Sets the Scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 8. 3 Setting route

The test signal mapping route is set here.

[Setting items]

The following items can be set.

- Unit and Unit channel
- Format
- Route1 and Route1 channel
- Route2 and Route2 channel
- Signalling channel

[Operation screen] The settings can be performed on the following screen.

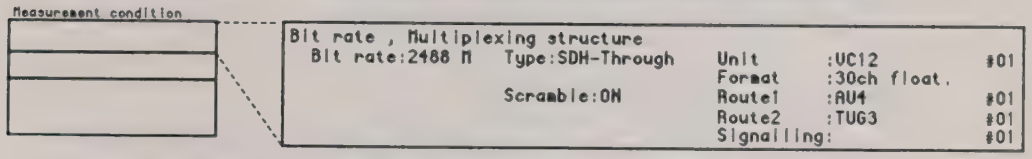


Fig. 5.8-4 Route setting screen

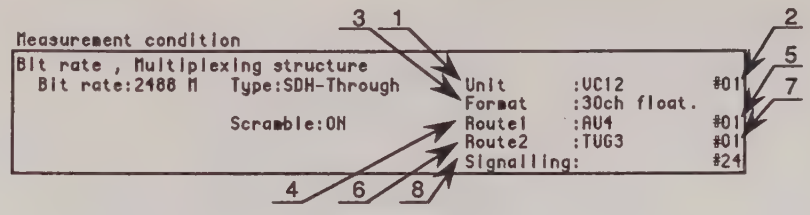


Fig. 5.8-5 Route settings

Unit Sets the Unit at 1.
The setting range is as follows:

[Setting range]

VC11	:	The specified channel of external signal exchanges to STM0 or STM1 of internal pattern
VC11(TU12)	:	
VC12	:	
VC3(TU3)	:	
VC3	:	
VC4	:	
STM0 (52M)	:	
STM1	:	
Through	:	Preforms through output
Repl. RSOH	:	The specified channel RSOH of external signal exchanges to internal pattern

Note:

1. VC11, VC11(TU12), VC12 and VC3(TU3) can be set when electrical option-25 or 26 is installed.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	Through, Repl. RSOH
156 M	VC11, VC11(TU12), VC12, VC3(TU3) VC3 STM0(52M) Through, Repl. RSOH
622 M 2488 M	VC11, VC11(TU12), VC12, VC3(TU3) VC3, VC4 STM0(52M), STM1 Through, Repl. RSOH

3. Program data is stored in STM0 (52M) and STM1. For further details, refer to section 5.8.4 Test Pattern Settings ●PRGM payload data.

Unit Channel

Sets the channel of internal generated pattern at 2.
The setting range is as follows:

[Setting range] #01 ~ #48 / step 1

Note:

Setting range has following restrictions according to the Bit rate of generated pattern and the Unit 1.

Unit	Setting range
VC11	#01 ~ #28
VC11(TU12) VC12	#01 ~ #21
Through Repl. RSOH	Unsettable

Bit rate	Unit	Setting range
52 M	(Don't care)	Unsettable
156 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #03
622 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #12
	VC4 STM1	#01 ~ #04
2488 M	VC3(TU3) VC3 STM0(52M)	#01 ~ #48
	VC4 STM1	#01 ~ #16

Format

Sets the Unit format of internal generated pattern at 3.
The setting range is as follows:

[Setting range]
Bulk
Async.
139 M Async.
34 M Async.
34 M Bit sync.
Bit float.
Bit locked
Byte float.
Byte locked
30ch float.
30ch locked
31ch float.
31ch locked
PRGM

Note: Setting range has following restrictions according to the Unit 1.

Unit	Setting range
VC11 VC11(TU12)	Bulk Async. Bit float., Bit locked Byte float., Byte locked
VC12	Bulk Async. Bit float., Bit locked 30ch float., 30ch locked, 31ch float., 31ch locked
VC3(TU3)	Bulk 34M Async. 34M Bit sync.
VC4	Bulk 139M Async.
STM0(52M) STM1	PRGM
Except above	Unsettable

Route1 Sets the AU of internal generated pattern at 4.
The setting range is as follows:

[Setting range] AU3
AU4

Note: Setting range has following restrictions according to the Bit rate of generated pattern and the Unit 1.

Bit rate	Unit	Setting range
52 M	(Don't care)	Unsettable
156 M 622 M	VC11 VC11(TU12) VC12	AU3, AU4
2488 M	VC3(TU3)	AU4
	Except above	Unsettable

Route1 Channel AU の設定対象となるチャネル5を設定します。
The setting range is as follows:

[Setting range] #01 ～ #48 ／ step 1

Note:

1. Route1 Channel 5 can be set when the Route1 4 is settable.
2. Setting range has following restrictions according to the Bit rate of generated pattern and the Route1 4.

Bit rate	Route 1	Setting range
156 M	AU3	#01 ~ #03
	AU4	#01
622 M	AU3	#01 ~ #12
	AU4	#01 ~ #04
2488 M	AU3	#01 ~ #48
	AU4	#01 ~ #16

Route2

Sets the TUG3 of internal generated pattern at 6.
The setting range is as follows:

[Setting range] TUG3

Note:

Route2 6 can be set when the Route1 4 is AU4 and Unit 1 is VC11, VC11(TU12), VC12 or VC3(TU3).

Route2 Channel

Sets the setting channel of TUG3 at 7.
The setting range is as follows:

[Setting range] #01 ~ #03 / step 1

Note:

Route2 channel 7 can be set when the Route2 6 is settable.

Signalling

Sets the signalling channel of internal generated pattern at 8.
The setting range is as follows:

[Setting range] #01 ~ #30 / step 1

Note:

Setting range has following restrictions according to the Format 3.

Format	Setting range
30ch float. 30ch locked	#01 ~ #30
Byte float. Byte locked	#01 ~ #24
Except above	Unsettable

5. 8. 4 Setting test pattern

The test signal pattern is set here.

[Setting items]

The following items can be set.

- Payload settings
  - Information pattern
  - PRBS frame
  - Dummy, R:Fixed stuff
  - Signalling pattern
- OH settings
  - SOH/POH Preset pattern
  - SOH/POH pattern SOH/POH
    PTR
  - Concatenation indicator
- Frame settings
  - PRGM payload data

[Operation screen]

The settings can be performed on the following screen.

- Payload settings

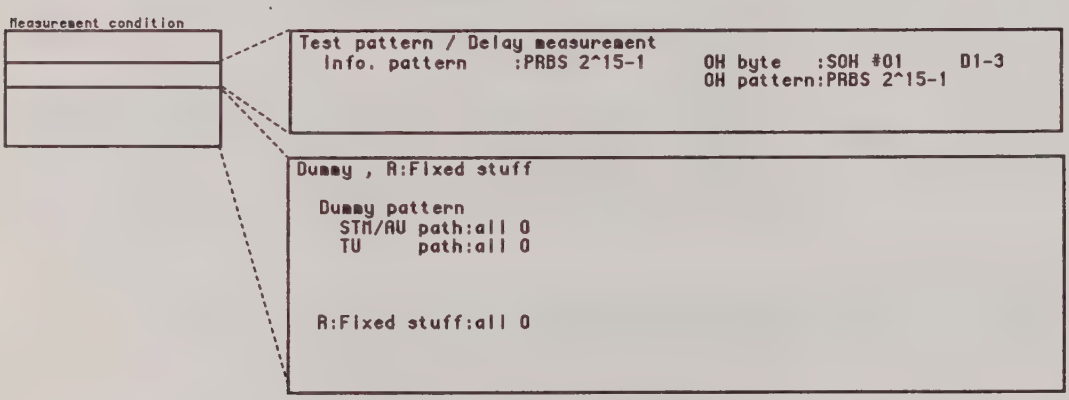


Fig. 5.8-6 Payload setting screen

- OH settings

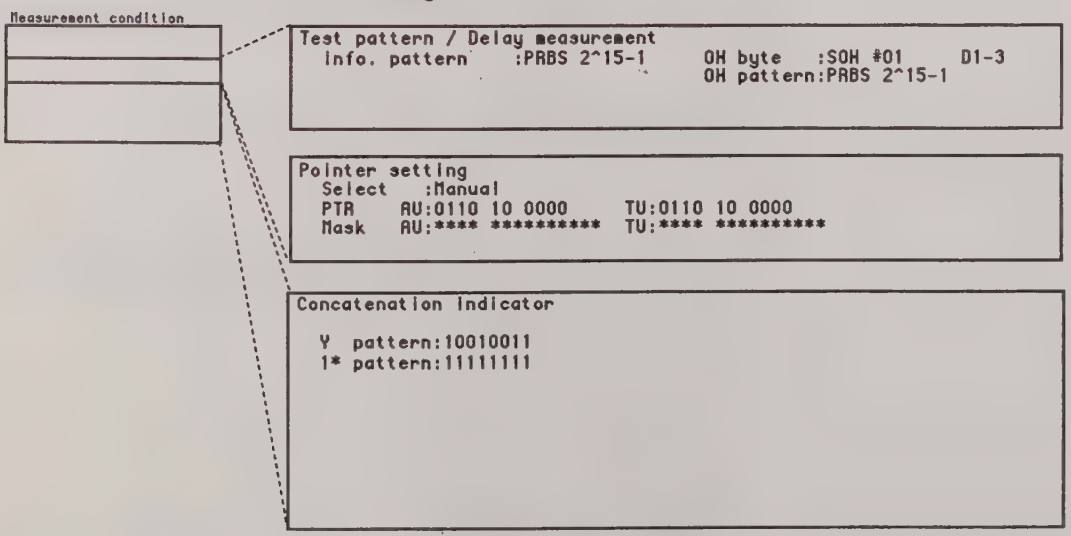


Fig. 5.8-7 OH setting screen

In addition, the following screens are available as pattern editing screen.

- PRGM SOH/POH preset data screen
- PRGM pointer 64-frame data screen

● Frame settings

PRGM payload data screen

[Related items]

The following items are affected.

Generated pattern	:	Bit rate
Route setting	:	Unit, Format

● Information pattern／Frame

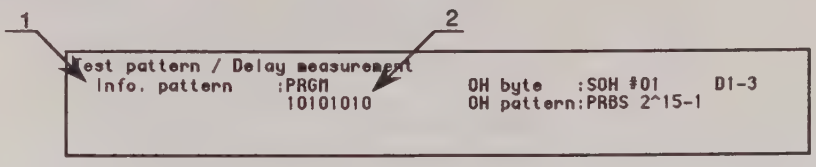


Fig. 5.8-8 Information pattern settings

Info. pattern — Sets the internal generated Information pattern at 1.
The setting range is as follows:

[Setting range]
- PRBS 2^9-1
- PRBS 2^11-1
- PRBS 2^15-1
- PRBS 2^20-1
- PRBS 2^20-1z
- PRBS 2^23-1
- PRGM
- all 0
- all 1

Note: Setting range has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Setting range								
		2^9-1	2^11-1	2^15-1	2^20-1	2^20-1z	2^23-1	PRGM	all 0 *	all 1 *
VC11	Bulk	×	×	○	○	○	○	○	○	○
VC11(TU12)	Except above	×	×	○	○	○	○	○	○	○
VC12	Bulk	×	×	○	○	×	○	○	○	○
	Except above	×	×	○	○	×	○	○	○	○
VC3(TU3)	Bulk	×	×	○	○	×	○	○	○	○
	Except above	×	×	○	○	×	○	○	○	○
VC3	Bulk	○	○	○	○	×	○	○	○	○
VC4	Bulk	○	○	○	○	×	○	○	○	○
	Except above	×	×	○	×	×	○	×	○	○
Except above	(Don't care)	Unsettable								

* : This can be set when PRBS frame is Framed ○ : Settable

PRGM pattern — Sets any 8-bit arbitrary pattern at 2.
The setting range is as follows:

[Setting range] 00000000 ～ 11111111 ／ bit-pattern settings

Note: PRGM pattern 2 can be set when the Info. pattern 1 is PRGM.

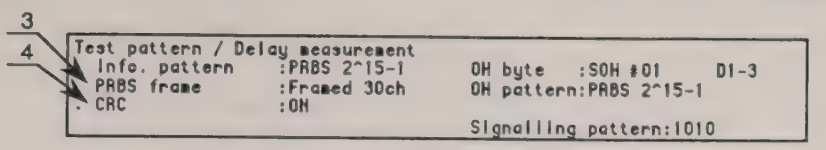


Fig. 5.8-9 PRBS frame settings

PRBS frame

Sets the PRBS frame at 3.
The setting range is as follows:

[Setting range]
- Unframed
- Framed 30ch
- Framed 31ch
- Framed SF
- Framed ESF

Note: Setting range has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Setting range				
		Unframed	30ch	31ch	SF	ESF
VC11	Bulk	Unsettable				
VC11(TU12)	Except above	○	×	×	○	○
VC12	30ch float. 30ch locked	○	○	×	×	×
	31ch float. 31ch locked	○	×	○	×	×
	Except above	Unsettable				
Except above	(Don't care)					

○ : Settable

CRC

Sets the CRC addition of PRBS frame at 4.
The setting range is as follows:

[Setting range]
- OFF : Does not add
- ON : Add

Note: CRC 4 can be set when the PRBS frame 3 is Framed 30ch.

● Dummy／Stuff pattern

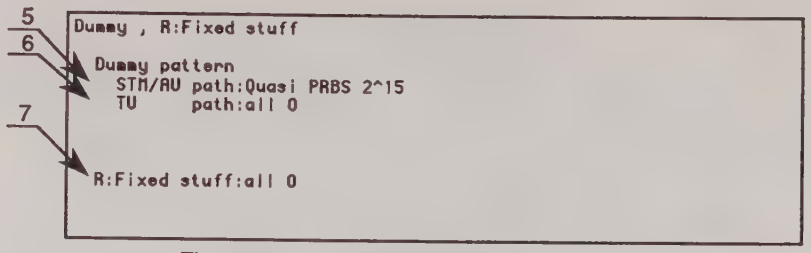


Fig. 5.8-10 Dummy/Stuff settings

STM／AU path — Sets the channel pattern of except Unit channel in STM／AU path of internal generated pattern at 5.
The setting range is as follows:

[Setting range] all 0
all 1
Quasi PRBS 2^15

TU path — Sets the channel pattern of except Unit channel in TU path of internal generated pattern at 6.
The setting range is as follows:

[Setting range] all 0
all 1

Note: TU path can be set when electrical option-25 or 26 is installed.

R : Stuff — Sets the Stuff bit pattern inserted into payload at 7.
The setting range is as follows:

[Setting range] all 0
all 1

● Signalling

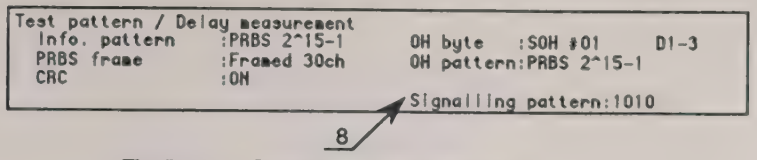


Fig. 5.8-11 Signalling pattern settings

Signalling pattern

Sets the Signalling bit pattern of internal generated pattern at 8.
The setting range is as follows:

[Setting range] 0000 ~ 1111 / bit-pattern settings

Note:

Signalling pattern 8 has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Signalling
VC11 VC11(TU12)	Byte float.	○
	Byte locked	○
	Except above	×
VC12	30ch float.	○
	30ch locked	○
	Except above	×
Except above	(Don't care)	×

○ : Settable

● SOH/POH preset pattern

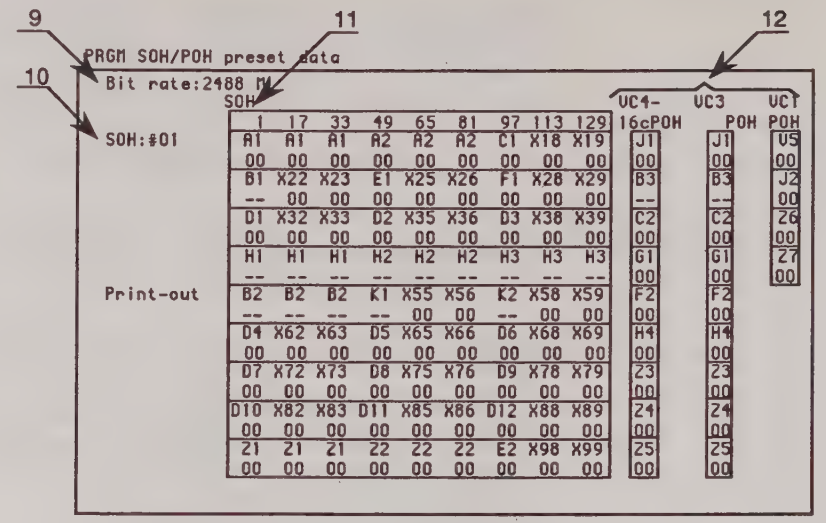


Fig. 5.8-12 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 9.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:

1. 2488M can be set only ME3620A.
2. The pattern setting is possible for arbitrary Bit rate, but the output data with the same Bit rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 10.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note: Setting range has following restrictions according to the Bit rate 9.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

SOH pattern

Sets the SOH preset pattern at 11.
The setting range is as follows:

[Setting range] All bytes except K1/K2, H1/H2/H3, B1 and B2

POH pattern

Sets the POH preset pattern at 12.
The setting range is as follows:

[Setting range]

◆VC4, VC4-4c, VC4-16c
All bytes except B3
◆VC3
All bytes except B3
◆VC1
V5, J2, Z6, Z7

Note:

1. VC1 POH can be set when electrical option-25 or 26 is installed.
2. VC4 POH label is changed as following according to the Bit rate 9.

Bit rate	POH label
52 M	Not display
156 M	VC4 POH
622 M	VC4-4c POH
2488 M	VC4-16c POH

＜Restriction item＞

1. Outputted SOH preset pattern is as follows according to the Unit and the Unit channel of Route setting.

Unit	SOH preset pattern
Through	Does not output
Repl. RSOH	SOH 1 ～ 3 row pattern at all SOH channel except B1
Except above	Pattern of SOH channel same as Unit channel

2. Outputted POH preset pattern is as follows according to the Bit rate of generated pattern and the Route setting.

Bit rate	Unit	Route1	POH output pattern		
			VC4	VC3	VC1
52 M	(Don't care)	(Don't care)	Output impossible		
156 M 622 M 2488 M	VC11	AU3	×	○	○
	VC11(TU12) VC12	AU4	○	×	○
	VC3(TU3)	(Don't care)	○	○	×
	VC3		×	○	×
	VC4		○	×	×
	Except above		Output impossible		

○ : Outputable

3. Multi-frame H4 byte setting has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	H4 setting range
VC11 VC11(TU12)	Bulk Async. Bit float.	1 ～ 6 bit
	Bit locked	All bits possible
	Byte float.	1 ～ 6 bit
	Byte locked	5, 6, 7 bit
VC12	Bulk Async. Bit float.	1 ～ 6 bit
	Bit locked	All bits possible
	30ch float. 31ch float.	1 ～ 6 bit
	30ch locked 30ch locked	1 ～ 6 bit

Except bits are set for hardware automatically.

4. V5 BIP-2 cannot be set. (Set automatically by hardware)

● SOH/POH pattern

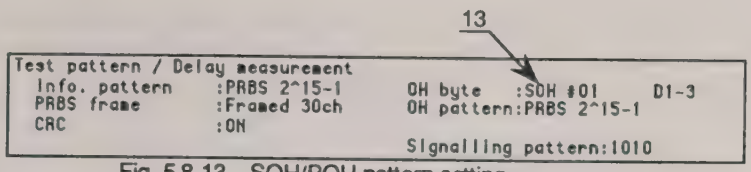


Fig. 5.8-13 SOH/POH pattern setting

Type Sets the type of OH performed pattern setting at 13.
The setting range is as follows:

[Setting range] OFF
SOH
POH

Note:

1. Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range		
	OFF	SOH	POH
Through	Unsettable		
Repl. RSOH STM0(52M) STM1	○	○	×
Except above	○	○	○

○ : Settable

2. At OFF, the pattern setting is not performed to OH byte. in this case, outputs the SOH/POH preset pattern.

◆SOH(Except PTR)

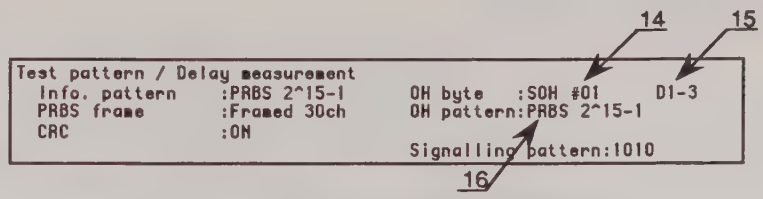


Fig. 5.8-14 SOH(Except PTR) pattern settings

SOH #No. Sets the SOH No. performed pattern setting at 14.
The setting range is as follows:

[Setting range] #01 ～ #16 ／ step 1

Note:

1. SOH #No. 14 can be set when the Type 13 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern and Unit of Route setting.
   - When the Unit is Repl. RSOH, changing by Bit rate of generated pattern because of screen composition.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ～ #04
2488 M	#01 ～ #16

   - When the Unit is except Repl. RSOH, only the same value as Unit channel of Route setting can be set.

SOH byte Sets the SOH byte performed pattern setting at 15.
The setting range is as follows:

[Setting range] 1 byte : All bytes except K1/K2, H1/H2/H3, B1 and B2
DCC(1-3) : 3 bytes of D1～D3
DCC(4-12) : 9 bytes of D4～D12

Note:

1. SOH byte 15 can be set when the Type 13 is SOH.
2. Setting range has following restrictions according to the Unit of Route setting and the SOH #No. 14.

Unit	SOH #No.	Setting range		
		1 byte	D1-3	D4-12
Repl. RSOH	#01	○*	○	×
	Except above	○*	×	×
Except above	#01	○	○	○
	Except above	○	×	×

* : SOH 1～3 row arbitrary byte except B1 byte ○ : Settable

OH pattern

Sets the insert pattern to SOH at 16.
The setting range is as follows:

[Setting range] Bit meas. OFF : Does not insert pattern
PRBS 2^11-1 : Inserts PRBS pattern
PRBS 2^15-1 : Inserts PRBS pattern

Note:

At Bit meas. OFF, the SOH/POH preset pattern is outputted.

◆Pointer

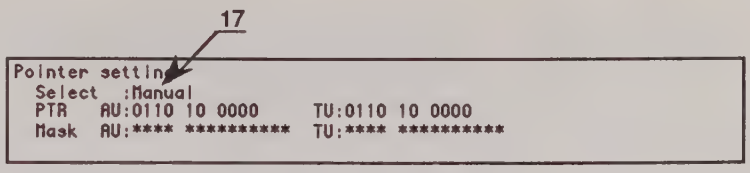


Fig. 5.8-15 Pointer pattern settings

Select Sets the pointer setting mode at 17.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting
PRGM 64-frame : Consecutive setting
PTR seq. test : Pointer sequence test

Note:

1. Pointer pattern cannot be set when the Format of Route setting is PRGM.
2. Manual and PRGM 64-frame have following restrictions.

Unit	Format	Manual		PRGM 64-frame	
		AU	TU	AU	TU
VC11	locked	○	×	○	×
VC11(TU12) VC12	Except above	○	○	○	○
VC3(TU3)	(Don't care)	○	○	○	○
VC3 VC4		○	×	○	×
Except above		Unsettable			

○ : Settable

3. PTR seq. test sees section 5.8.8 Pointer sequence test.

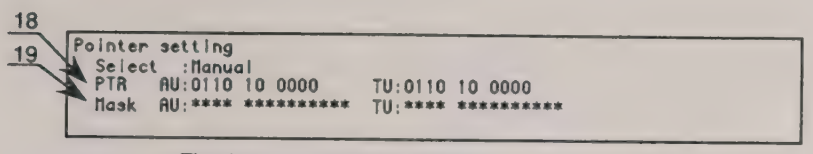


Fig. 5.8-16 Manual settings

PTR Sets the AU pointer or TU pointer pattern at 18.
Setting range and setting method are as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings
PTR : 0~1023 / step 1

[Setting method] Cursor sets on the pointer pattern 18, setting is possible by 2 types of method as follows:
(1) Setting using NDF
Open the window, sets pointer value.
(2) Setting using Justification
When Step up key pressed or Rotary encoder turn to the right, +Justification is generated, and when Step down key pressed or Rotary encoder turn to the left, −Justification is generated.

Mask Sets the Mask bit at 19.
The setting range is as follows:

[Setting range] NDF : **** ~ MMMM * : Not Mask
ID : ********** M : Mask
~ MMMMMMMMMM

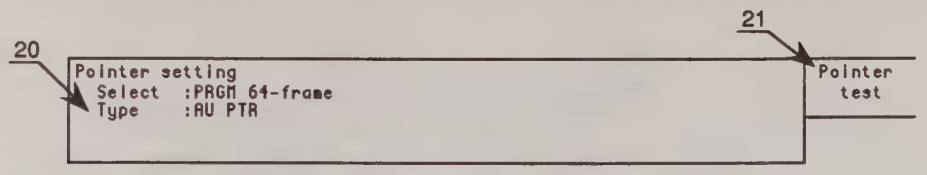


Fig. 5.8-17 PRGM 64-frame settings

Type — Sets the type of pointer performed 64-frame setting at 20.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Pointer test — Sets the output control using function key at 21.
The setting range is as follows:

[設定範囲] Pointer test OFF : Does not set pattern
Pointer test ON : Set pattern

Note: In the case of Pointer test ON, data set 'PRGM pointer 64-frame data' is outputted, but in the case of Pointer test OFF, data set Manual 18, 19 is outputted.

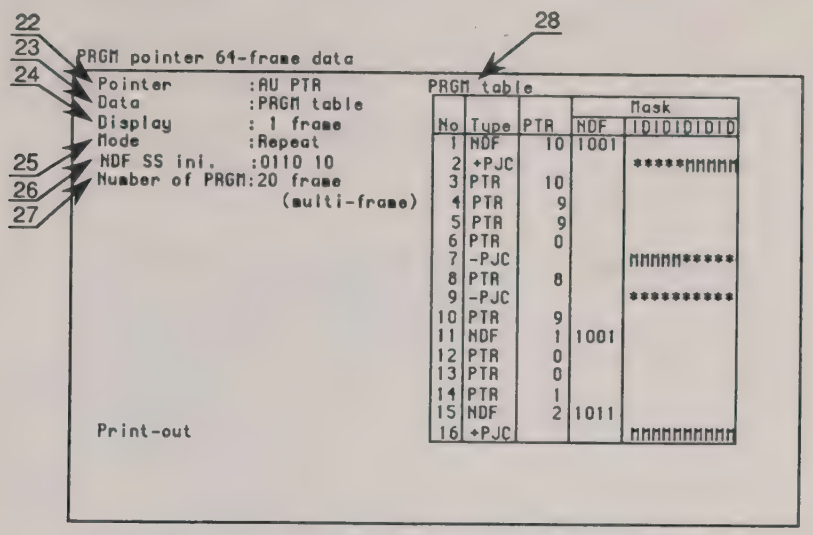


Fig. 5.8-18 PRGM 64-frame pattern settings

Pointer Sets the type of pointer performed pattern setting at 22.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Note: TU PTR can be set when electrical option-25 or 26 is installed.

Number of PRGM Sets the output frame No. at 27.
The setting range is as follows:

[Setting range] 2 ~ 64 / step 1

Note: When the Pointer 22 is AU PTR and Mode 25 is Single, 64 cannot be set.

NDF SS ini. Sets the initial value of NDF and SS at 26.
The setting range is as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings

Mode

Sets the action mode at 25.
The setting range is as follows:

[Setting range] Single
Repeat

PRGM table

Sets the PRGM pattern of pointer at 28.
The setting range is as follows:

[Setting range] When Type is NDF,
PTR : 0 ~ 1023 / step 1
NDF : 0000 ~ 1111 / bit-pattern settings
When Type is PTR,
PTR : 0 ~ 1023 / step 1
When Type is +PJC or -PJC,
ID : ********** ~
MMMMMMMMMM
* : Not Mask
M : Mask

Note: There are following restrictions in the pattern setting:

- No.1 can be set only NDF.
- The repeat point can be set only PTR.
- +PJC and -PJC cannot be set the consecutive setting.
- When the just before PTR value is out of following value, +PJC and -PJC cannot be set.

Pointer	Unit	Pointer Range
AU	(Don't care)	0 ~ 782
TU	VC11	0 ~ 103
	VC11(TU12) VC12	0 ~ 139
	VC3(TU3)	0 ~ 764

Data

Sets the switch of display data at 23.
The setting range is as follows:

[Setting range] PRGM table : Setting value
Memory : Setting value is spread to output data

Note:

The Memory has following features:

- ■ indicates that the reverse of ID bit is masked in +PJC/-PJC.
- Succeeding data to frame No. of 'Number of PRGM 27' cannot be displayed.

PRGM table

No	Type	PTR	Mask NDF	Mask ID1ID1ID1ID1
1	NDF	10	1001	
2	+PJC			■■■■■MMMM
3	PTR	10		
4	PTR	9		
5	PTR	9		
6	PTR	0		
7	-PJC			MMMM■■■■■
8	PTR	8		
9	-PJC			■■■■■■■■■■
10	PTR	9		
11	NDF	1	1001	
12	PTR	0		
13	PTR	0		
14	PTR	1		
15	NDF	2	1011	
16	+PJC			MMMMMMMMMM

Memory

No	Output NDF	SS	Output ID1ID1ID1ID1	Internal JI	
1	1001	10	0000001010	10	NDF
2	0110	10	1010 C101C		+PJC
3	0110	10	0000001010	11	
4	0110	10	0000001001	9	PTR
5	0110	10	0000001001	9	PTR
6	0110	10	0000000000	0	PTR
7	0110	10	CCCCC10101		-PJC
8	0110	10	0000001000	782	
9	0110	10	0110100100		+PJC
10	0110	10	0000001001	0	
11	1001	10	0000000001	1	NDF
12	0110	10	0000000000	0	PTR
13	0110	10	0000000000	0	PTR
14	0110	10	0000000001	1	PTR
15	1011	10	0000000010	2	NDF
16	0110	10	CCCCCCCC1C		+PJC

Fig. 5.8-19 Data displayings

Display

Sets the head position of data display at 36.
The setting range is as follows:

[Setting range] 1 ~ 49 / step 1

Note:

When Pointer 22 is AU PTR and Mode 25 is Single, 49 cannot be set.

◆POH

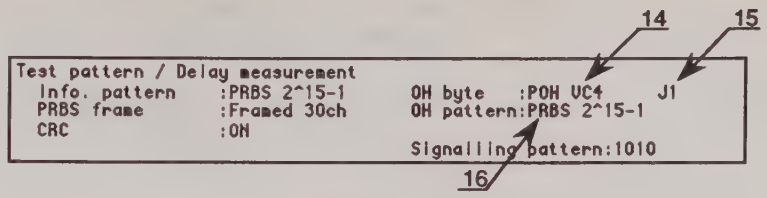


Fig. 5.8-20 POH settings

POH type Sets the type of POH performed pattern setting at 14.
The setting range is as follows:

[Setting range] VC4
VC3
VC1

Note:
1. POH type 14 can be set when the Type 13 is POH.
2. Setting range has following restrictions according to the Route setting.

Unit	Format	Route1	Setting range
VC11 VC11(TU12) VC12	Except locked	AU3	VC3, VC1
		AU4	VC4,VC1
	locked	AU3	VC3
		AU4	VC4
VC3(TU3)	(Don't care)		VC4, VC3
VC3			VC3
VC4			VC4
Except above			Unsettable

POH byte Sets the POH byte performed pattern setting at 15.
The setting range is as follows:

[Setting range] ◆VC3, VC4
All bytes except B3
◆VC1
V5, J2, Z6, Z7

Note: POH byte 15 can be set when the Type 13 is POH.

OH pattern

Sets the POH pattern at 16.
The setting range is as follows:

[Setting range]

Bit meas. OFF	: Not insert pattern
PRBS 2^11-1	: Inserts PRBS pattern
PRBS 2^15-1	: Inserts PRBS pattern

Note: At Bit meas. OFF, the SOH/POH preset pattern is outputted.

● Concatenation Indicator

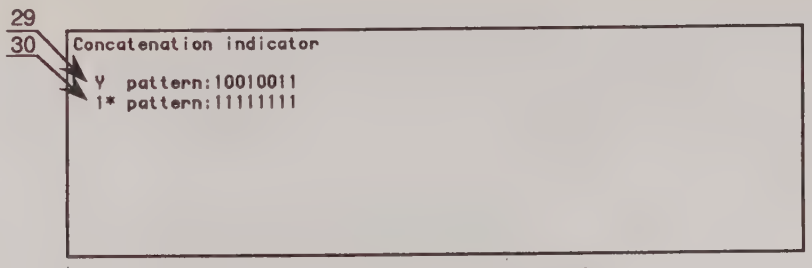


Fig. 5.8-21 Concatenation pattern settings

Y pattern Sets the Y byte of AU pointer at 29.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

1 * pattern Sets the 1 * byte in AU pointer at 30.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

● PRGM payload data

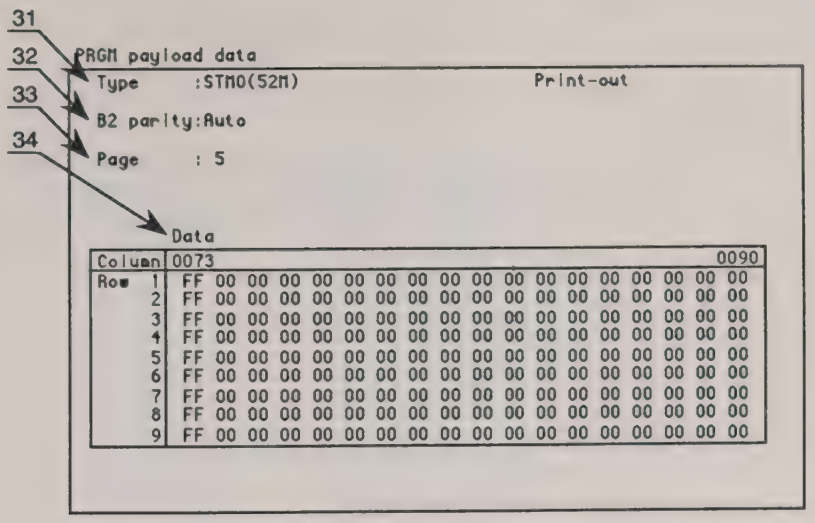


Fig. 5.8-22 PRGM payload data pattern settings

Type Sets the frame size performed pattern setting at 31.
The setting range is as follows:

[Setting range] STM0 (52M) : 9 x 90 bytes
STM1 : 9 x 270 bytes

B2 parity Sets the B2 calculation method at 32.
The setting range is as follows:

[Setting range] Auto : Calculate automatically and output
PRGM : Output set pattern into B2

Page Sets the pattern display position at 33.
The setting range is as follows:

[Setting range] 1 ~ 15 / step 1

Note: Setting range has following restrictions according to the Type 31.

Type	Setting range
STM0(52M)	1 ~ 5
STM1	1 ~ 15

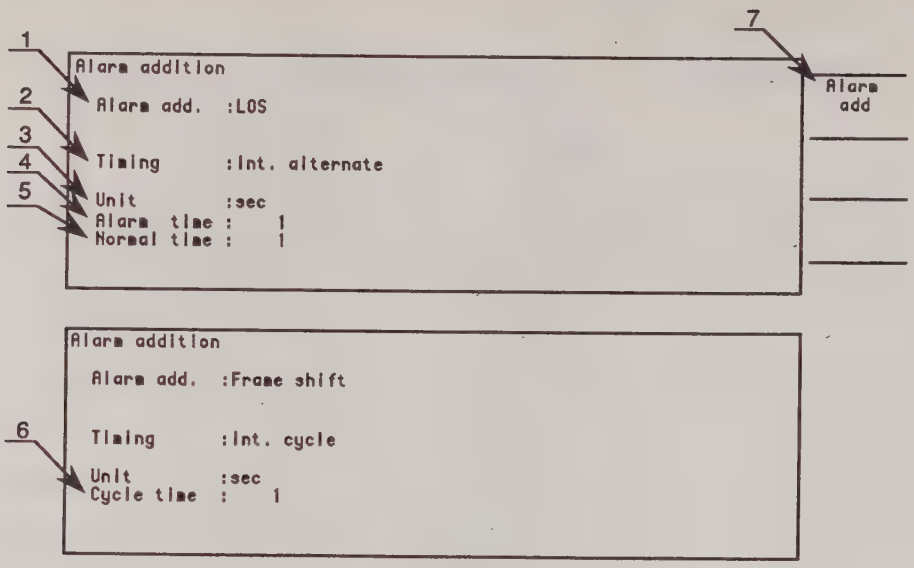


Fig. 5.8-24 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

[Setting range]		
	OFF	: Does not alarm addition
	LOS	: Sets output signal interrupt
	OOF	: Frame sync loss
	LOF	: Frame sync loss
	AU AIS	: AU level set to all 1s
	AU LOP	: AU PTR set to out of range
	AU FERF	: G1 b5 set to '1'
	TU AIS	: All bits set to all 1s containing TU PTR
	TU LOP	: TU PTR set to out of range
	TU FERF	: V5 b8 set to '1'
	H4 OOF	: H4 bit is reversed
	PDH OOF	: Frame error
	Info. AIS	: Information set to all 1s
	Signalling OOF	: Signalling bit is reversed
	Signalling BAIS	: b6(Ybit) of time slot 17 of frame(F0) containing Multi-frame signal set to '1'
	Frame shift	: 1 bit shift

Setting range of Alarm add. 1 has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Setting range							
		OFF	LOS	OOF	LOF	AU AIS	AU LOP	AU FERF	Frame shift
Through	(Don't care)	○	○	×	×	×	×	×	×
Repl. RSOH STM0(52M) STM1		○	○	○	○	×	×	×	○
Except above		○	○	○	○	○	○	○	○

○ : Settable

Unit	Format	Setting range							
		TU AIS	TU LOP	TU FERF	H4 OOF	PDH OOF	Info. AIS	Sig. OOF	Sig. BAIS
VC11 VC11(TU12)	Bulk	○	○	○	○	×	×	×	×
	Async.	○	○	○	○	○	○	×	×
	Bit float.	○	○	○	○	○	○	×	×
	Bit locked	○	×	×	×	○	○	×	×
	Byte float.	○	○	○	○	○	○	○	×
	Byte locked	○	×	×	×	○	○	○	×
VC12	Bulk	○	○	○	○	×	×	×	×
	Async.	○	○	○	○	○	○	×	×
	Bit float.	○	○	○	○	○	○	×	×
	Bit locked	○	×	×	×	○	○	×	×
	30ch float.	○	○	○	○	○	○	○	○
	30ch locked	○	×	×	×	○	○	○	○
	31ch float.	○	○	○	○	○	○	×	×
	31ch locked	○	×	×	×	○	○	×	×
VC3(TU3)	Bulk	○	○	○	×	×	×	×	×
	34M Async.	○	○	○	×	×	○	×	×
	34M Bit Sync.	○	○	○	×	×	○	×	×
Except above	(Don't care)	×	×	×	×	×	×	×	×

Timing

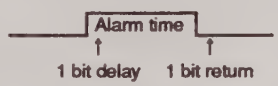
Sets the addition timing at 2.
The setting range is as follows:

[Setting range]
- Int. single
- Int. cycle
- Int. all
- Int. alternate
- Ext. gate

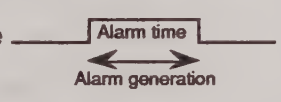
■Control signal

Int. single

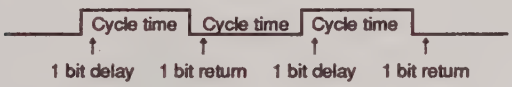
Frame shift



Except above



Int. cycle

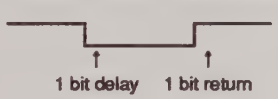


Int. all — Adds every frame

Int. alternate

Ext. gate — Adds according to the Input signal from Control Input Alarm/Trigger connector

Frame shift



Except above

Note: Setting range has following restrictions according to the Alarm add. 1.

Alarm add.	Setting range				
	Int. single	Int. cycle	Int. all	Int. alternate	Ext. gate
Frame shift	○	○	×	×	○
Info. AIS PDH OOF	×	×	○	×	×
Ecept above	○	×	○	○	○

○ : Settable

Unit — Sets the Unit of addition time at 3.
The setting range is as follows:

[Setting range] Frame
μsec
msec
sec

Note:
1. Unit 3 can be set when the Timing 2 is Int. single or Int. alternate.
2. Setting range has following restrictions according to the Alarm add. 1. (see following table)

Alarm time — Sets the alarm addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time — Sets the alarm no addition time at 5.
The setting range is as follows:

[Setting range] See following table

Cycle time — Sets the execution time of Frame shift at 6.
The setting range is as follows:

[Setting range] See following table

Alarm add.	Alarm time / Normal time / Cycle time Setting range			
	Frame	μsec	msec	sec
LOS	Unsettable	5 ~ 99875 /5	1 ~ 8000 /1	1 ~ 8 /1
OOF	1 ~ 23 /1	125 ~ 2875 /125	1 ~ 2 /2	Unsettable
LOF	24 ~ 40000 /1	Unsettable	3 ~ 8000 /1	1 ~ 8 /1
AU AIS AU LOP AU FERF	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
TU AIS TU LOP TU FERF H4 OOF	4 ~ 40000 /4	500 ~ 99500 /500	1 ~ 8000 /1	
Sig. OOF	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Sig. BAIS	16 ~ 40000 /16	2000 ~ 98000 /2000	2 ~ 8000 /2	
Frame shift	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	

Alarm add

Controls the execution of Alarm addition by using 'Alarm add' function key at 7.
The setting range is as follows:

[Setting range] Alarm add OFF : Does no add alarm
Alarm add ON : Adds alarm

Note:

1. The Alarm add 7 is disable when the Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with the Timing 2. In addition, the LED of alarm item being added light on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' function key label is released from the reverse-display and the alarm is not added. In addition, the LED of alarm item being added go off on the front panel alarm section.

● OOF/LOF

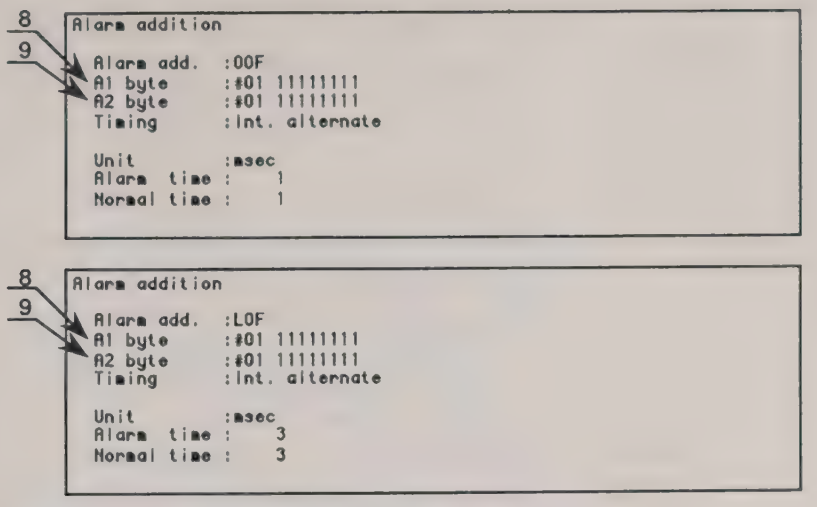


Fig. 5.8-25 OOF/LOF settings

A1 byte
A2 byte

Sets the byte position and alarm pattern of A1/A2 byte at 8 and 9.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ~ #48 / step 1
◆Pattern
00000000 ~ 11111111
/ bit-pattern settings

Note: Setting range of byte position has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01 ~ #03
622 M	#01 ~ #12
2488 M	#01 ~ #48

● AU LOP/TU LOP

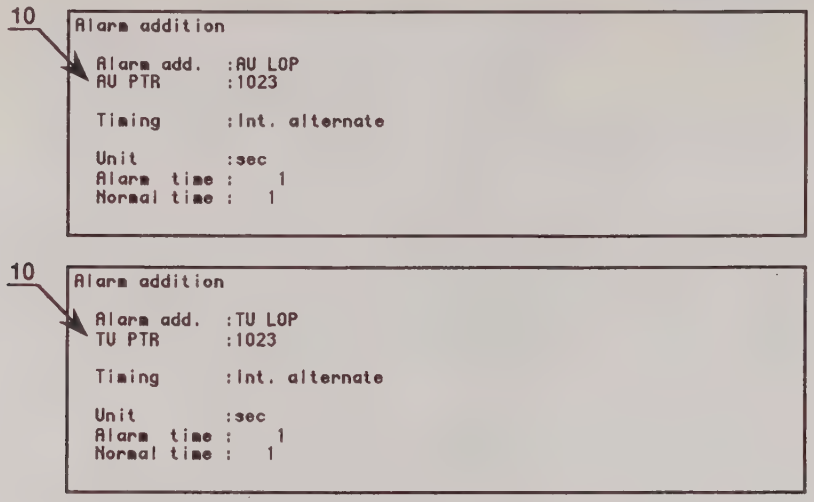


Fig. 5.8-26 AU LOP/TU LOP settings

AU PTR
TU PTR

Sets the alarm pattern of pointer at 10.
The setting range is as follows:

[Setting range] 104 ~ 1023 / step 1

Note: Setting range has following restrictions according to the Unit of Route setting.

PTR	Unit	Setting range
TU	VC11	104 ~ 1023
	VC11(TU12)	140 ~ 1023
	VC12	
	VC3(TU3)	765 ~ 1023
AU	(Don't care)	783 ~ 1023

● H4 OOF

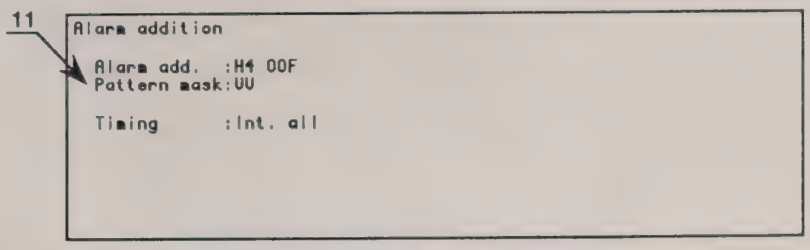


Fig. 5.8-27 H4 OOF settings

Pattern mask — Sets the alarm pattern of H4 bit at 11.
The setting range is as follows:

[Setting range] ＊＊ ～ VV ／ ＊ : Not reverse
V : Reverse

● Signalling OOF

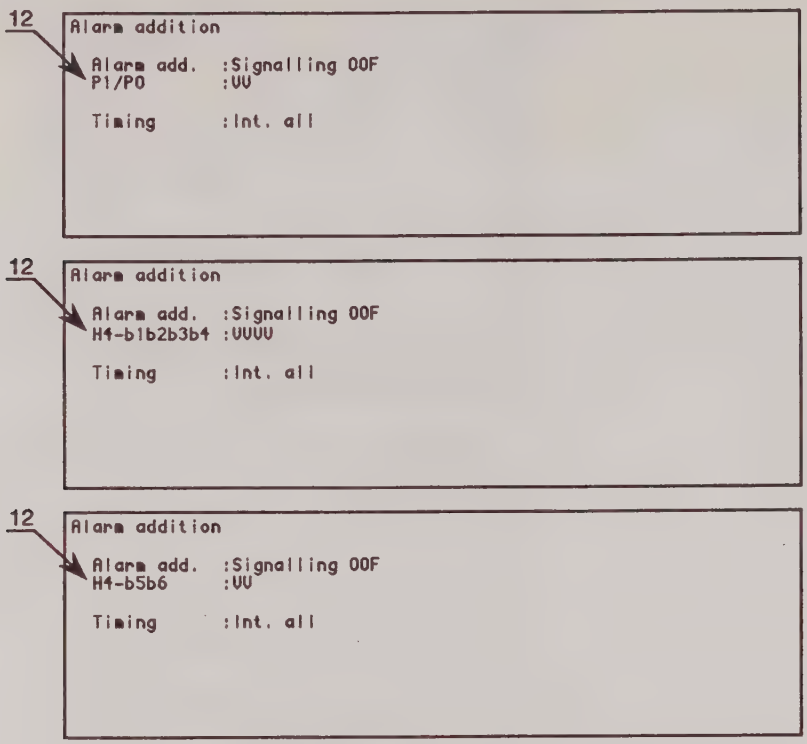


Fig. 5.8-28 Signalling OOF settings

P1/P0
H4-b1b2b3b4
H4-b5b6

Sets the alarm pattern of Signalling bit at 12.
The setting range is as follows:

[Setting range] ◆P1/P0, H4-b5b6
＊＊ ～ VV ／ ＊ : Not reverse
V : Reverse

◆H4-b1b2b3b4
＊＊＊＊ ～ VVVV ／ ＊ : Not reverse
V : Reverse

Note: Setting range has following restrictions according to the Format of Route setting.

Format	Setting range		
	P1/P0	b1b2b3b4	b5b6
30ch float.	○	×	×
30ch locked	×	×	○
Byte float.	○	×	×
Byte locked	×	○	×
Except above	Unsettable		

○ : Settable

5. 8. 6 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF
All areas : Bit all
PRBS pattern inserted in OH : Bit OH PRBS

Bit error add

[Operation screen] The settings can be performed on the following screen.

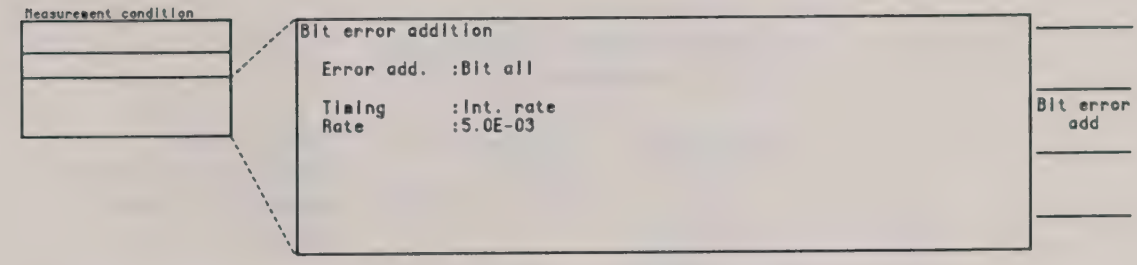


Fig. 5.8-29 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

[Related items] The following items are affected.

Route setting : Unit
Test pattern : OH pattern

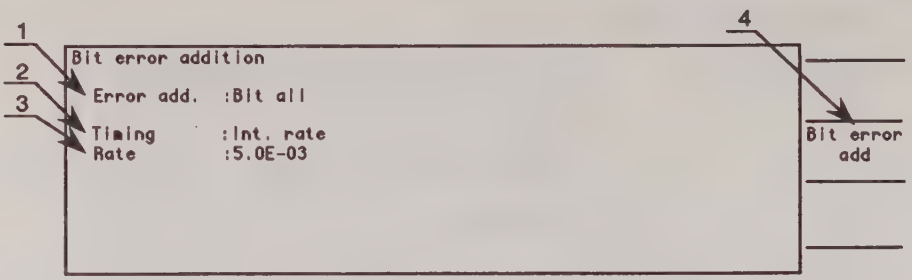


Fig. 5.8-30 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range] OFF : Does not add error
Bit all : Adds error all areas of signal
Bit OH PRBS : Adds error PRBS area inserted in OH

Note: Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range		
	OFF	Bit all	Bit OH PRBS
Through	○	○	×
VC11 VC11(TU12) VC12 VC3(TU3)	○	×	*○
Except above	○	○	*○

○ : Settable

* : Setting cannot be performed when OH type of test pattern is OFF or OH pattern is except PRBS.

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range]
- Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
- Int. rate : Adds error according to error rate
- Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range]
- 5.0E-03
- 1.0E-03
- 1.0E-04
- 1.0E-05
- 1.0E-06
- 1.0E-07
- 1.0E-08
- 1.0E-09
- 1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range]
- Bit error add OFF : Does not add error
- Bit error add ON : Adds error

Note:
1. The Bit error add 4 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of error item being added (Bit or OH bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 8. 7 Parity／FEBE error addition

The Parity／FEBE error addition items are set here.

[Setting items] The following items can be set.

OFF
Parity B1
B2
B3
BIP-2
FEBE B3 FEBE
VC1 FEBE

Parity/FEBE error add

[Operation screen] The settings can be performed on the following screen.

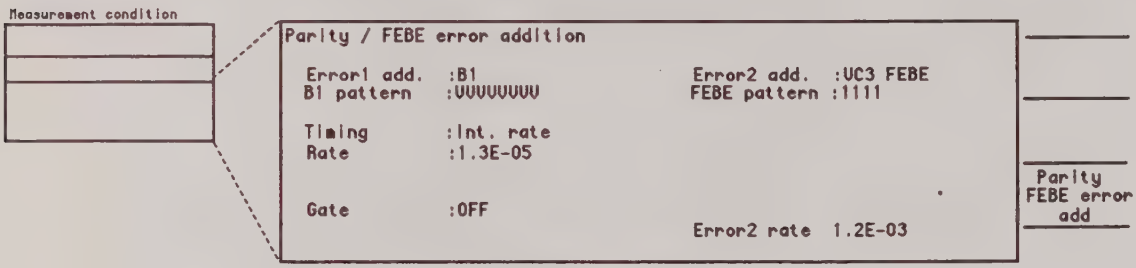


Fig. 5.8-31 Parity／FEBE error addition screen

Note:

1. Two types of error: Error1 and Error2 can be set simultaneously, but the Error2 addition timing is performed at the Error1 set timing.
2. The set error items are not enabled when the 'Parity/FEBE error add' function key is disabled.

[Related items] The following items are affected.

Generation pattern : Bit rate
Route setting : Unit, Format

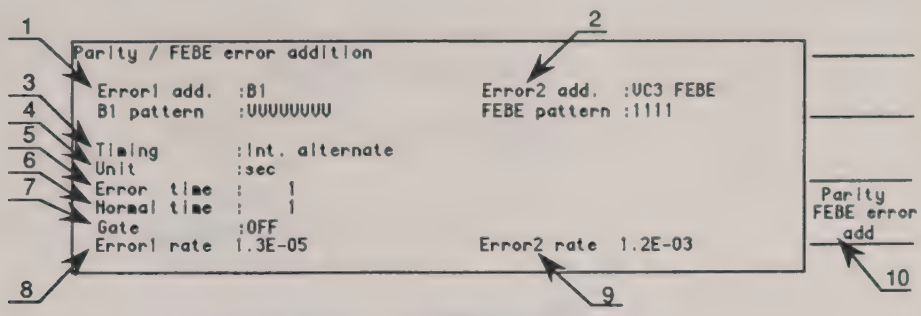


Fig. 5.8-32 Parity/FEBE error settings

Error1 add.
Error2 add.

Sets the error addition items at 1, 2.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
B1	: Adds error arbitrary bit in B1
B2	: Adds error arbitrary bit in B2
B3	: Adds error arbitrary bit in B3
BIP-2	: Adds BIP-2 error
B3 FEBE	: Sets pattern to G1 b1~b4
VC1 FEBE	: Sets pattern to V5 b3

Note:

1. The error addition cannot be performed when the Error1 add. 1 is OFF.
2. The same item cannot be set at the Error1 add. 1 and the Error2 add. 2 except at OFF.
3. When the Error1 add. 1 (Error2 add. 2) is set BIP-2 (VC1 FEBE), the Error2 add. 2 (Error1 add. 1) can be set only VC1 FEBE (BIP-2).
4. Setting range of Error1 add. 1 and Error2 add. 2 has following restrictions according to the Unit and the Format of Route setting.

Unit	Format	Setting range						
		OFF	B1	B2	B3	BIP-2	B3 FEBE	VC1 FEBE
Through	(Don't care)	Unsettable						
Repl. RSOH		○	○	×	×	×	×	×
VC11	locked	○	○	○	○	×	○	×
VC11(TU12) VC12	Except above	○	○	○	○	○	○	○
VC3(TU3) VC3 VC4	(Don't care)	○	○	○	○	×	○	×
STM0(52M) STM1		○	○	○	×	×	×	×

○ : Settable

Timing

Sets the addition timing at 3.
The setting range is as follows:

[Setting range]
- Int. single
- Int. all
- Int. rate
- Int. alternate
- Ext. single

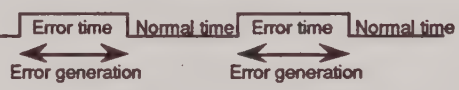
■Control signal

Int. single — When Parity/FEBE error add 10 is OFF→ON, adds 1 frame

Int. all — Adds every frame

Int. rate — Adds used to set error rate

Int. alternate



Ext. single — Adds 1 frame at falling edge of input signal from Control Input Error connector

Note:

1. Int. rate cannot be set when the Error1 add. 1 is VC1 FEBE.
2. The addition timing of Error2 add. 2 is same as the Error1 add. 1.

Unit

Sets the Unit of addition time at 4.
The setting range is as follows:

[Setting range]
- Frame
- μsec
- msec
- sec

Note:

Unit 4 can be set when the Timing 3 is Int. alternate.

Error time Sets the error addition time at 5.
The setting range is as follows:

[Setting range] See following table

Normal time Sets the error no addition time at 6.
The setting range is as follows:

[Setting range] See following table

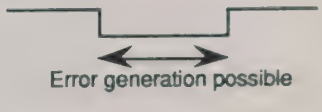
Unit	Error time / Normal time Setting range			
	Frame	μsec	msec	sec
VC11 VC11(TU12) VC12	4 ~ 40000 /4	500 ~ 99500 /500	1 ~ 8000 /1	1 ~8 /1
Except above	1 ~ 40000 /1	125 ~ 99875 /125		

Note: Error time 5 and Normal time 6 can be set when the Timing 3 is Int. alternate.

Gate Sets the error control according to external signal at 7.
The setting range is as follows:

[Setting range] OFF : Does not external control
External : Adds error while the input signal from Control Input Error connector is Low level

■Control signal
External



Error generation possible

Note: Gate 7 can be set when the Timing 3 is Int. all, Int. rate or Int. alternate.

Error1 rate

Displays the added rate at 8.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:

1. Error1 rate 8 is displayed when the Error1 add. 1 is except VC1 FEBE and the Timing 3 is Int. alternate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Error2 rate

Displays the added rate at 9.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:

1. Error2 rate 9 is displayed when the Timing 3 is Int. alternate or Int. rate. But, it is not displayed when the Error2 add. 2 is VC1 FEBE.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Parity/FEBE error add

Controls the execution of Parity/FEBE error addition by using the 'Parity/FEBE error add' function key at 10.
The setting range is as follows:

[Setting range] Parity/FEBE error add OFF : Does not add
Parity/FEBE error add ON : Adds error

Note:

1. The Parity/FEBE error add 10 is disable when the Error1 add. 1 is OFF.
2. When the Parity/FEBE error add is ON, The 'Parity/FEBE error add' function key label is reverse-displayed and the error items being set are added in accordance with the Timing 3. In addition, the LEDs of Parity/FEBE error items being added light on the front panel error section.
3. When the Parity/FEBE error add is OFF, the 'Parity/FEBE error add' function key label is released from the reverse-display and the error is not added. In addition, the LEDs of Parity/FEBE error items being added go off on the front panel error section.

● B1

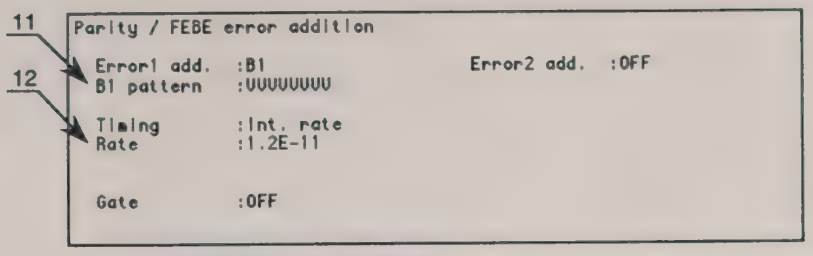


Fig. 5.8-33 B1 settings

B1 pattern — Sets the added pattern at 11.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ VVVVVVVV
＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 12.
The setting range is as follows:

[Setting range] 1.5E-12 ～ 6.2E-04

Note:

1. Rate 12 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B1 pattern 11. (see table 5.4-1)

● B2

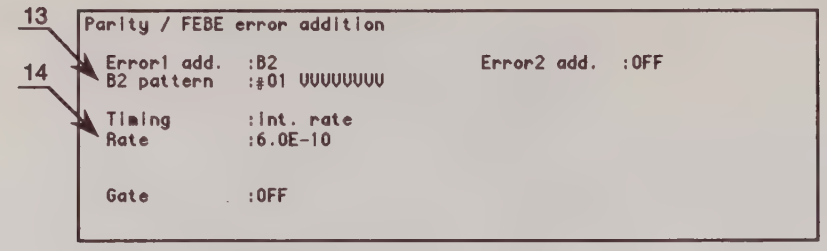


Fig. 5.8-34 B2 settings

B2 pattern

Sets the byte position and added pattern at 13.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ~ #48 / step 1
◆Pattern
＊＊＊＊＊＊＊＊ ~ VVVVVVVV
＊ : Does not add
V : Adds pattern

Note:

Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range	
	Byte position	Pattern
52 M	#01	Total 8 bits ＊/V
156 M	#01 ~ #03	Total 24 bits ＊/V
622 M	#01 ~ #12	Total 96 bits ＊/V
2488 M	#01 ~ #48	Total 384 bits ＊/V

Rate

Sets the added rate at 14.
The setting range is as follows:

[Setting range] 1.6E-12 ~ 6.2E-04

Note:

1. Rate 14 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B2 pattern 13. (see table 5.4-1)

● B3

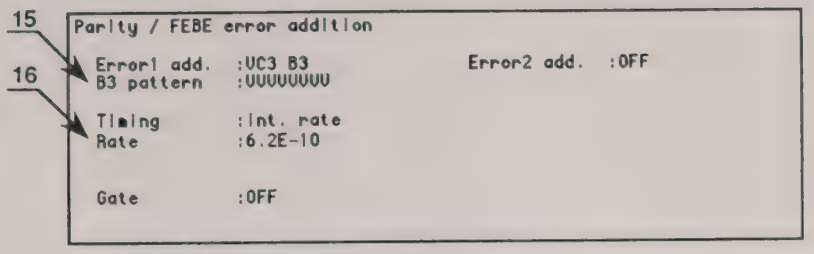


Fig. 5.8-35 B3 settings

B3 pattern — Sets the added pattern at 15.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ V V V V V V V V

＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 16.
The setting range is as follows:

[Setting range] 1.6E-12 ～ 8.5E-04

Note:

1. Rate 16 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the B3 pattern 15. (see table 5.4-1)

● BIP-2

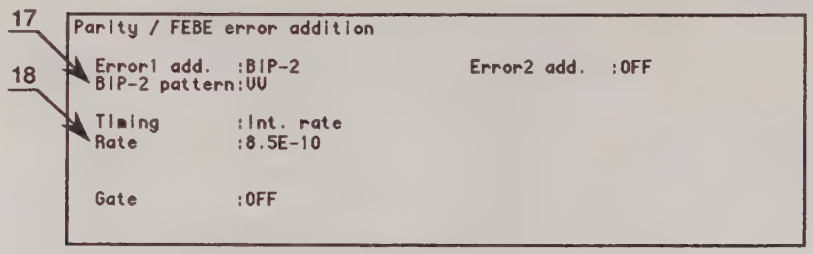


Fig. 5.8-36 BIP-2 settings

BIP-2 pattern — Sets the added pattern at 17.
The setting range is as follows:

[Setting range] ＊＊ ～ V V

＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 18.
The setting range is as follows:

[Setting range] 4.3E-10 ～ 3.0E-04

Note:

1. Rate 18 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the BIP-2 pattern 17. (see table 5.4-1)

● B3 FEBE

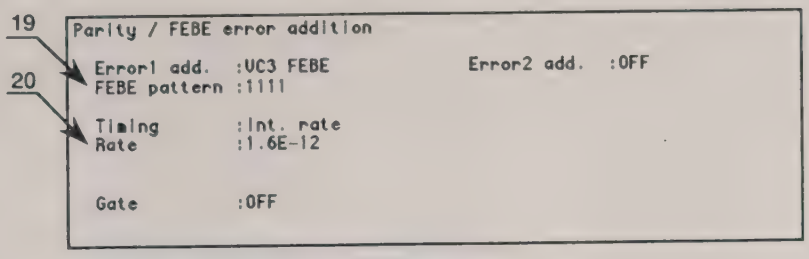


Fig. 5.8-37 B3 FEBE settings

FEBE pattern — Sets the added pattern at 19.
The setting range is as follows:

[Setting range] 0000 ~ 1111 ／ bit-pattern settings

Rate — Sets the added rate at 20.
The setting range is as follows:

[Setting range] 1.6E-12 ~ 1.6E-03

Note:

1. Rate 20 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the FEBE pattern 19. (see table 5.4-1)

● VC1 FEBE

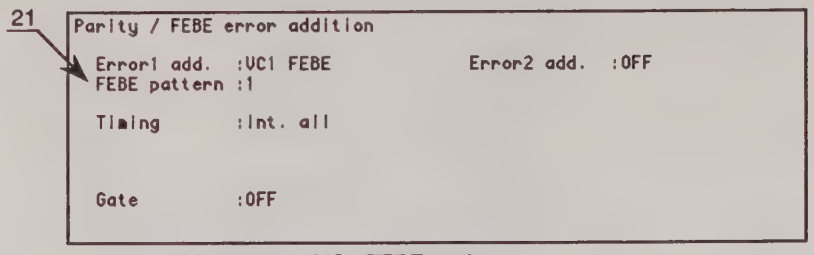


Fig. 5.8-38 VC1 FEBE settings

FEBE pattern — Sets the added pattern at 21.
The setting range is as follows:

[Setting range] 0 ～ 1 ／ bit-pattern settings

5. 8. 8 Pointer sequence test

The items for pointer test are set here.

[Setting items] The following items can be set.

- CCITT G.783
  - Single of opposite polarity
  - Regular with double
  - Regular with missing
  - Double of opposite polarity
- T1X 1.6
  - Burst with 3 pointer
  - Periodic with addition
  - Periodic with cancellation
- User program
  - Burst
  - Periodic with addition
  - Periodic with cancellation
  - Opposite polarity
  - Regular with double
  - Regular with missing

[Operation screen] The settings can be performed on the following screen.

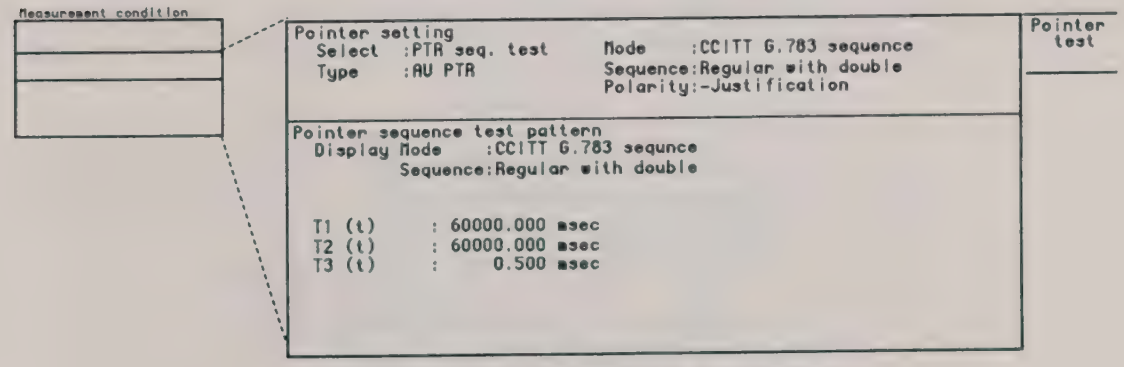


Fig. 5.8-39 Pointer sequence test setting screen

Note: The execution of pointer sequence test needs to the electrical option-25 or 26.

[Related items] The following items are affected.

Test pattern : Cons. 0/1
Route setting : Format

● Setting of execution condition

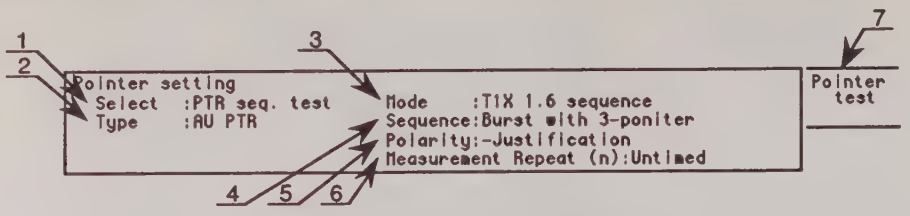


Fig. 5.8-40 Pointer sequence test settings

Select Sets the pointer setting mode at 1.
The setting range is as follows:

[Setting range] PTR seq. test

Note: Select 1 cannot be set when the Format of Route setting is PRGM.

Type Sets the type of executed pointer at 2.
The setting range is as follows:

[Setting range] AU PTR
TU PTR

Note: Setting range has following restrictions according to the Unit and Format of Route setting and the Info. pattern of test pattern.

Unit	Format	Info. pattern	Setting range	
			AU	TU
VC11 VC11(TU12) VC12	Bulk	(Don't care)	○	○
	locked		○	×
	Except above	Add	○	×
		Except above	○	○
VC3(TU3)	Bulk	(Don't care)	○	○
	Except above	Add	○	×
		Except above	○	○
VC3 VC4 VC4-4c VC4-16c	(Don't care)		○	×
Except above			×	×

○ : Settable

Mode

Sets the generation mode at 3.
The setting range is as follows:

[Setting range]
CCITT G.783 sequence
T1X 1.6 sequence
User program sequence

Sequence

Sets the execution sequence at 4.
The setting range is as follows:

[Setting range]
Burst with 3-pointer
Periodic with addition
Periodic with cancellation
Single of opposite polarity
Regular with double
Regular with missing
Double of opposite polarity
Burst
Opposite polarity

Note: Setting range has following restrictions according to the Mode 3.

Setting range	Mode		
	G.783	T1X 1.6	User
Burst with 3-pointer	○	×	×
Periodic with addition	○	×	○
Periodic with cancellation	○	×	○
Single of opposite polarity	×	○	×
Regular with double	×	○	○
Regular with missing	×	○	○
Double of opposite polarity	×	○	×
Burst	×	×	○
Opposite polarity	×	×	○

○ : Settable

Polarity

Sets the Adjustment polarity at 5.
The setting range is as follows:

[Setting range]
+Justification
-Justification

Note: Polarity 5 cannot be set when the Sequence 4 is Single of opposite polarity or Double of opposite polarity.

Measurement Repeat (n)

Sets the repeat time of measurement section at 6.
The setting range is as follows:

[Setting range] 1 ~ 4095 / step 1 or Untimed

Note: Measurement Repeat (n) 6 cannot be set when the Mode 3 is CCITT G.783 sequence.

Pointer test

Controls the execution of Pointer sequence test by using the 'Pointer test' function key at 7.
The setting range is as follows:

[Setting range] Pointer test OFF : Does not Pointer test
Pointer test ON : Executes pointer test

Note:
1. At Pointer test ON, the 'Pointer test' function key label is reverse-displayed and the Pointer test is executed.
2. At Pointer test OFF, the reverse-displayed 'Pointer test' function key label goes off and the Pointer test is not executed.

● Pattern settings

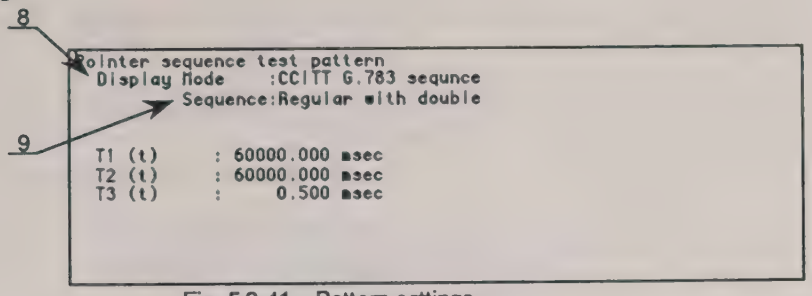


Fig. 5.8-41 Pattern settings

Display Mode — Sets the generation mode performed pattern editing 8.
The setting range is as follows:

[Setting range]
- CCITT G.783 sequence
- T1X 1.6 sequence
- User program sequence

Sequence — Sets the execution sequence performed pattern editing at 9.
The setting range is as follows:

[Setting range]
- Burst with 3-pointer
- Periodic with addition
- Periodic with cancellation
- Single of opposite polarity
- Regular with double
- Regular with missing
- Double of opposite polarity
- Burst
- Opposite polarity

Note: Setting range has following restrictions according to the Display Mode 8.

Setting range	Mode		
	G.783	T1X 1.6	User
Burst with 3-pointer	○	×	×
Periodic with addition	○	×	○
Periodic with cancellation	○	×	○
Single of opposite polarity	×	○	×
Regular with double	×	○	○
Regular with missing	×	○	○
Double of opposite polarity	×	○	×
Burst	×	×	○
Opposite polarity	×	×	○

○ : Settable

◆ Burst with 3-pointer (T1X 1.6)

Fig. 5.8-42 Event time diagram (+PJC)

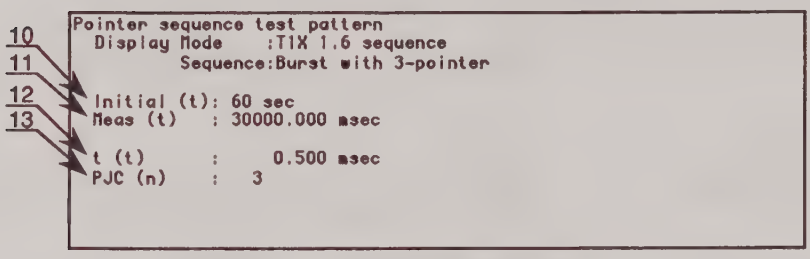


Fig. 5.8-43 Burst with 3-pointer settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 30000.000 msec

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 3

(Trigger output)

Trigger signal can be output at Burst with 3-pointer execution.
The output condition is as follows:

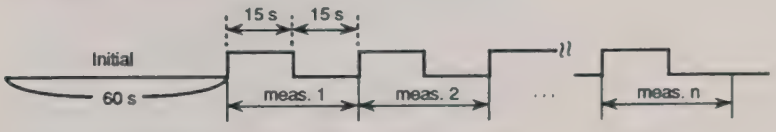


Fig. 5.8-44 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Periodic with addition (T1X 1.6)

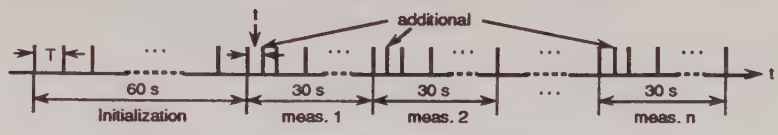


Fig. 5.8-45 Event time diagram (+PJC)

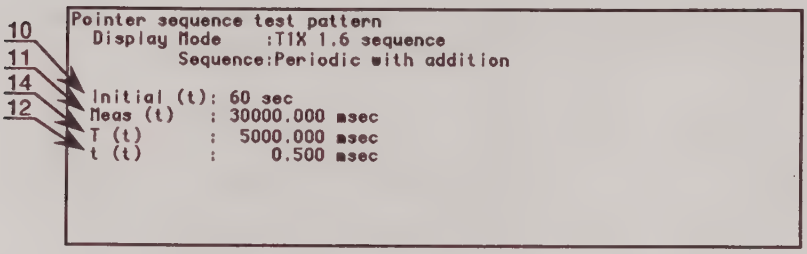


Fig. 5.8-46 Periodic with addition settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 30000.000 msec

t (t) Sets the generation interval of added PJC at 12.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[setting range] 1.000 ~ 30000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 30000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 30000ms

(Trigger output) Trigger signal can be output at Periodic with addition execution.
The output condition is as follows:

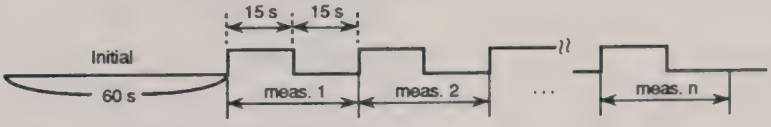


Fig. 5.8-47 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Periodic with cancellation (T1X 1.6)

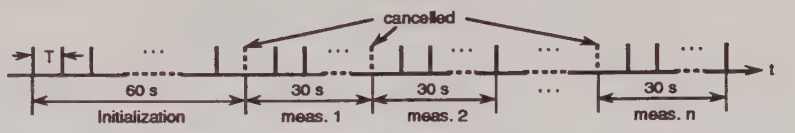


Fig. 5.8-48 Event time diagram (+PJC)

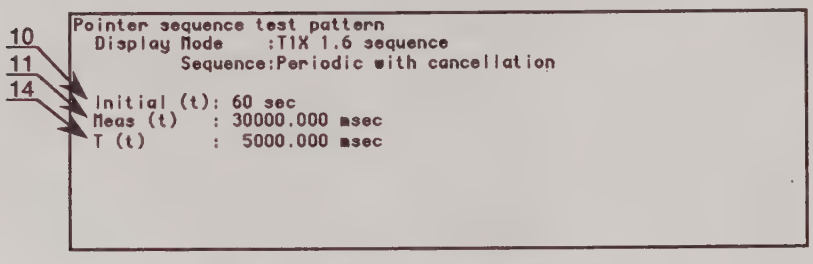


Fig. 5.8-49 Periodic with cancellation settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 60 sec

Meas (t) Sets the 1 measurement period 11.
The setting range is as follows:

[Setting range] 30000.000 msec

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 1.000 ~ 30000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 30000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 30000ms

(Trigger output)

Trigger signal can be output at Periodic with cancellation execution.
The output condition is as follows:

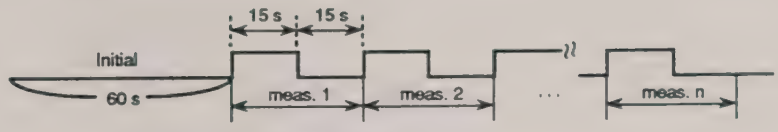


Fig. 5.8-50 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Single of opposite polarity (G.783)

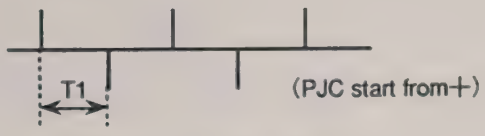


Fig. 5.8-51 Event time diagram

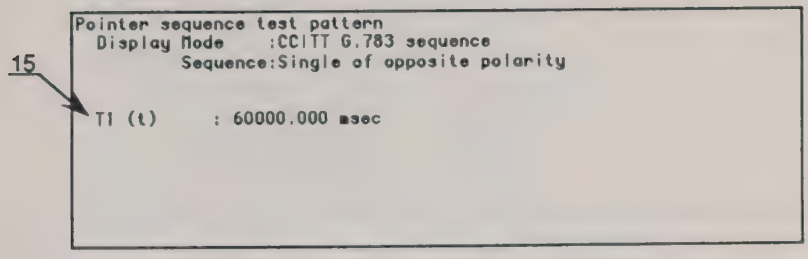


Fig 5.8-52 Single of opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

(Trigger output) Trigger signal can be output at Single of opposite polarity execution.
The output condition is as follows:

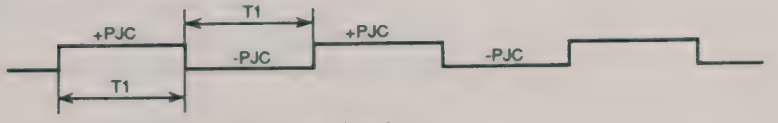


Fig. 5.8-53 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Regular with double (G.783)

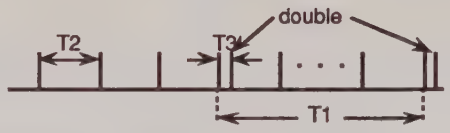


Fig. 5.8-54 Event time diagram (+PJC)

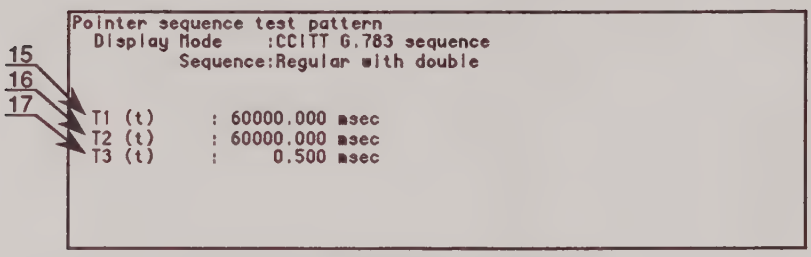


Fig. 5.8-55 Regular with double settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step T2

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note:

1. Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

2. T1 is changed by T2 value.

T3 (t) Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

(Trigger output) Trigger signal can be output at Regular with double execution.
The output condition is as follows:

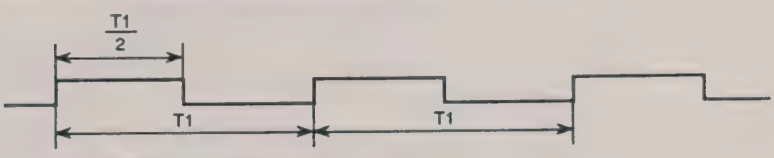


Fig. 5.8-56 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Regular with missing (G.783)

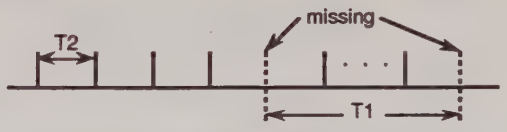


Fig. 5.8-57 Event time diagram (+PJC)

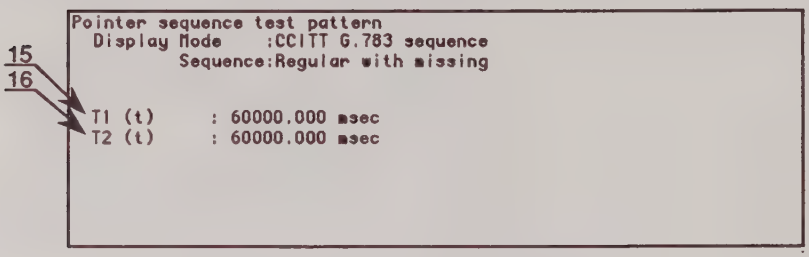


Fig. 5.8-58 Regular with missing settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step T2

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note:

1. Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

2. T1 is changed by T2 value.

(Trigger output)

Trigger signal can be output at Regular with missing execution.
The output condition is as follows:

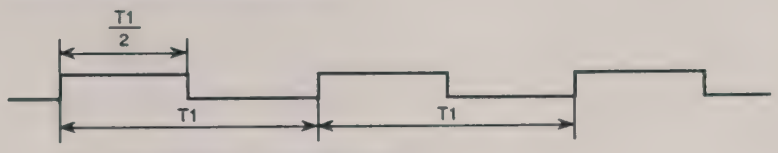


Fig. 5.8-59 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Double of opposite polarity (G.783)

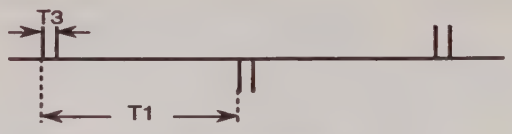


Fig. 5.8-60 Event time diagram

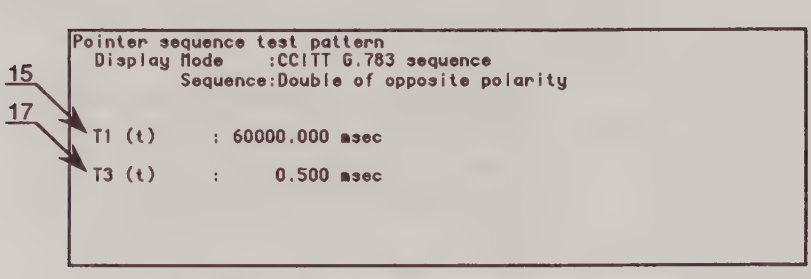


Fig. 5.8-61 Double of opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 1.000 ~ 80000.000 msec / step 1

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	1ms ~ 60000ms
TU PTR	VC3(TU3)	
	Except above	4ms ~ 80000ms

T3 (t) Sets the generation period of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 msec or 2.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	500 μs
TU PTR	VC3(TU3)	
	Except above	200ms

(Trigger output) Trigger signal can be output at Double of opposite polarity execution. The output condition is as follows:

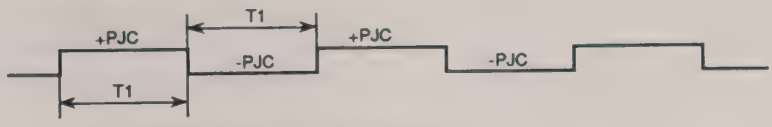


Fig. 5.8-62 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'. Setting method sees section 5.8.9 Trigger output.

◆ Burst (User)

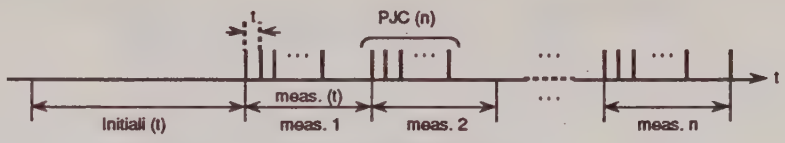


Fig. 5.8-63 Event time diagram (+PJC)

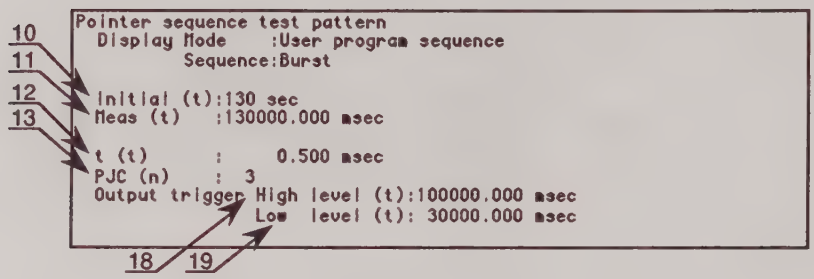


Fig. 5.8-64 Burst settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting. However, Meas (t) ≧ t (t) x PJC (n)

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] Same as Meas (t) 11

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 0 ~ 4095 / step 1

(Trigger output)

Trigger signal can be output at Burst execution.
The output condition is as follows:

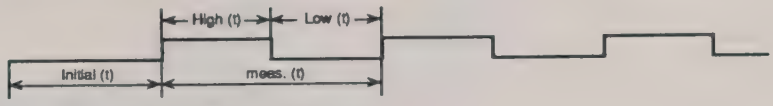


Fig. 5.8-65 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

Output trigger High level (t)

Sets the 'H' level time of trigger signal at 18. (see Fig. 5.8-65)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec

Note:

Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t)

Sets the 'L' level time of trigger signal at 19. (see Fig. 5.8-65)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Periodic with addition (User)

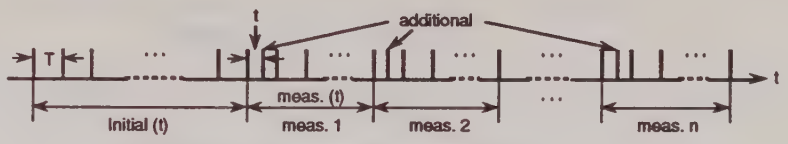


Fig. 5.8-66 Event time diagram (+PJC)

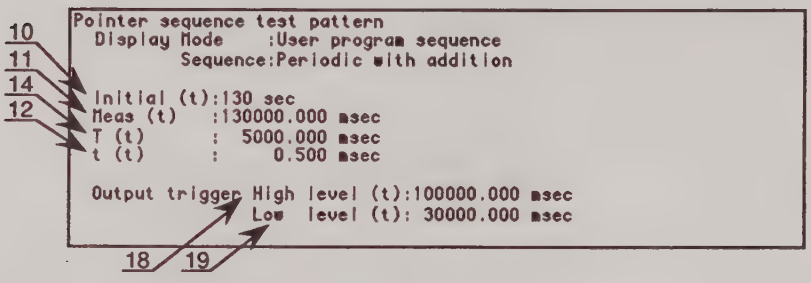


Fig. 5.8-67 Periodic with addition settings

Initial (t) Sets the initialize period at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement period at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

t (t) Sets the generation interval of PJC at 12.
The setting range is as follows:

[Setting range] Same as Meas (t) 11

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms / 0.5

(Trigger output) Trigger signal can be output at Periodic with addition execution.
The output condition is as follows:

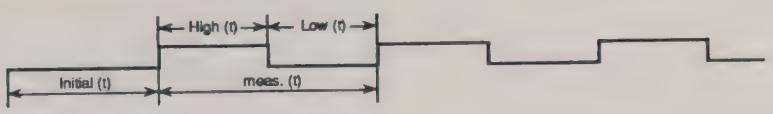


Fig. 5.8-68 Trigger signal

Note: Trigger signal outputs when tthe Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.8-68)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.8-68)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Periodic with cancellation (User)

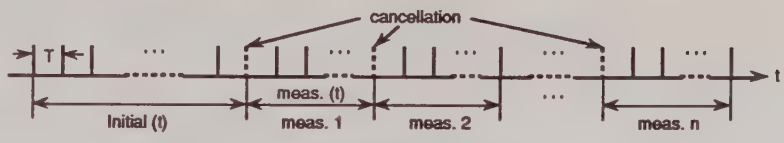


Fig. 5.8-69 Event time diagram (+PJC)

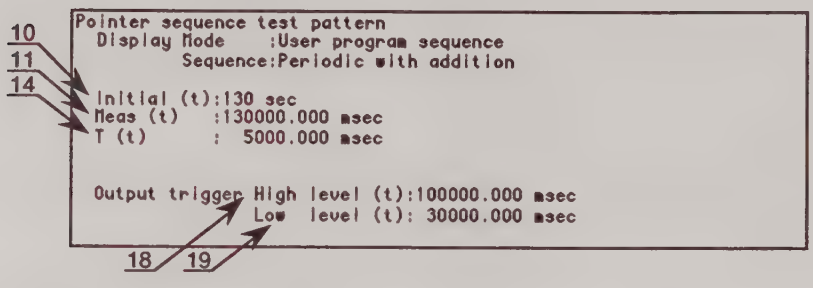


Fig. 5.8-70 Periodic with addition setting

Initial (t) Sets the initialize time at 10.
The setting range is as follows:

[Setting range] 0 ~ 130 sec / step 1

Meas (t) Sets the 1 measurement time at 11.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

T (t) Sets the generation interval of PJC periodical at 14.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms / 0.5

(Trigger output) Trigger signal can be output at Periodic with cancellation execution. The output condition is as follows:

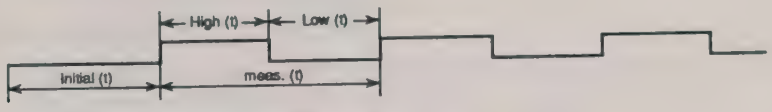


Fig. 5.8-71 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'. Setting method sees section 5.8.9 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.8-71) The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec / step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.8-71) The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Opposite polarity (User)

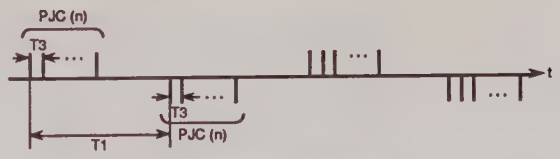


Fig. 5.8-72 Event time diagram

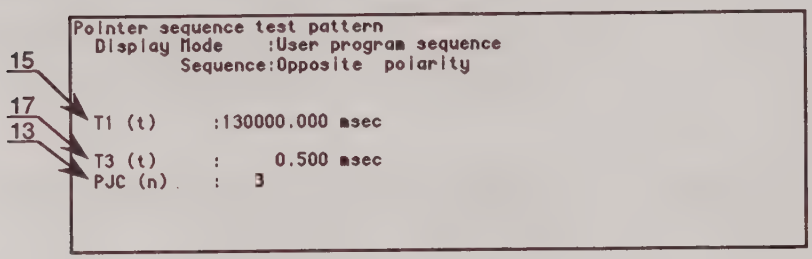


Fig. 5.8-73 Opposite polarity settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T3 x PJC (n).

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms / 0.5

T3 (t) Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.250 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.25ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	1ms ~ 520000ms / 0.5

PJC (n)

Sets the PJC time of 1 measurement period at 13.
The setting range is as follows:

[Setting range] 1 ~ 1000 / step 1

(Trigger output)

Trigger signal can be output at Opposite polarity execution.
The output condition is as follows:

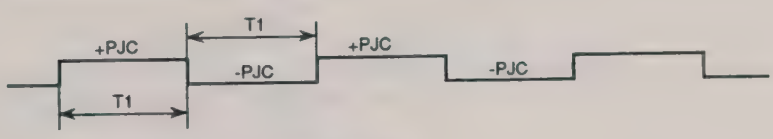


Fig. 5.8-74 Trigger signal

Note:

Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

◆ Regular with double (User)

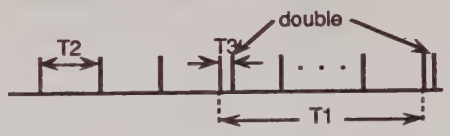


Fig. 5.8-75 Event time diagram

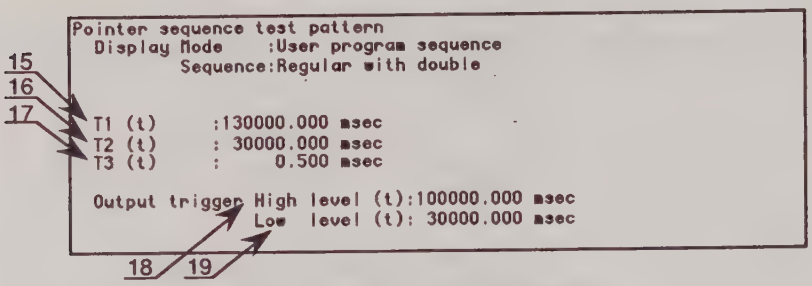


Fig. 5.8-76 Regular with double settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2 and T2 > T3.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms / 0.5

T3 (t) Sets the generation interval of added PJC at 17.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	2ms ~ 520000ms ／0.5

(Trigger output) Trigger signal can be output at Regular with double execution.
The output condition is as follows:

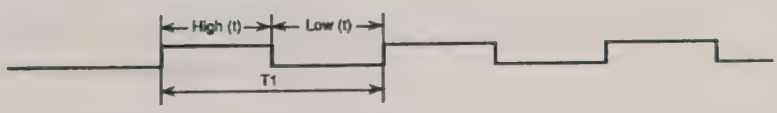


Fig. 5.7-77 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

Output trigger High level (t) Sets the 'H' level time of trigger signal at 18. (see Fig. 5.8-77)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec ／ step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms ／0.5

Low level (t) Sets the 'L' level time of trigger signal at 19. (see Fig. 5.8-77)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

◆ Regular with missing (User)

Fig. 5.8-78 Event time diagram (+PJC)

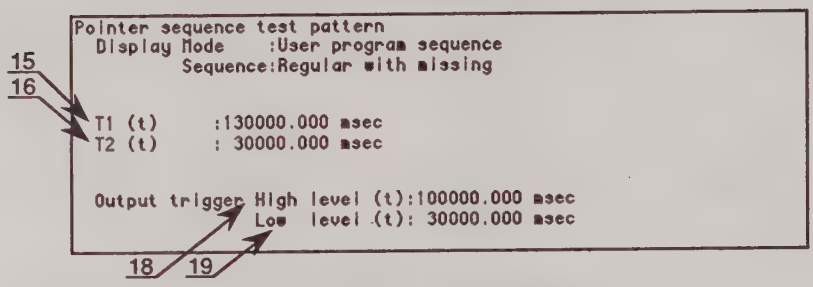


Fig. 5.8-79 Regular with missing settings

T1 (t) Sets the 1 measurement period at 15.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

T2 (t) Sets the generation interval of PJC periodical at 16.
The setting range is as follows:

[Setting range] 0.500 ~ 520000.000 msec

Note: Setting range of T1 and T2 have following restrictions according to the Type 2 and the Unit of Route setting. However, T1 ≧ T2.

Type	Unit	Setting range
AU PTR	(Don't care)	0.5ms ~ 130000ms ／0.125
TU PTR	VC3(TU3)	
	Except above	4ms ~ 520000ms ／0.5

(Trigger output)

Trigger signal can be output at Regular with missing execution.
The output condition is as follows:

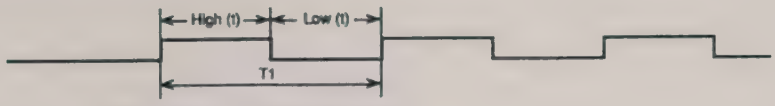


Fig. 5.8-80 Trigger signal

Note: Trigger signal outputs when the Output trigger is 'Pointer sequence trig.'.
Setting method sees section 5.8.9 Trigger output.

Output trigger High level (t)

Sets the 'H' level time of trigger signal at 18. (see Fig. 5.8-80)
The setting range is as follows:

[Setting range] 0.125 ~ 520000.000 msec / step 0.125

Note: Setting range has following restrictions according to the Type 2 and the Unit of Route setting.

Type	Unit	Setting range
AU PTR	(Don't care)	0.125ms ~ 130000ms / 0.125
TU PTR	VC3(TU3)	
	Except above	0.5ms ~ 520000ms / 0.5

Low level (t)

Sets the 'L' level time of trigger signal at 19. (see Fig. 5.8-80)
The setting range is as follows:

[Setting range] Same as High (t) 18
However, Low (t) = Meas (t) - High (t)

5. 8. 9 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source	OFF
	Alarm/APS test
	Bit error
	Parity/FEBE error
	AU PTR change
	AU PTR +PJC
	AU PTR - PJC
	TU PTR change
	TU PTR +PJC
	TU PTR -PJC
	Info. PRBS sync
	Frame pulse
	Multi-frame pulse
	Pointer seq. test

[Operation screen] The settings can be performed on the following screen.

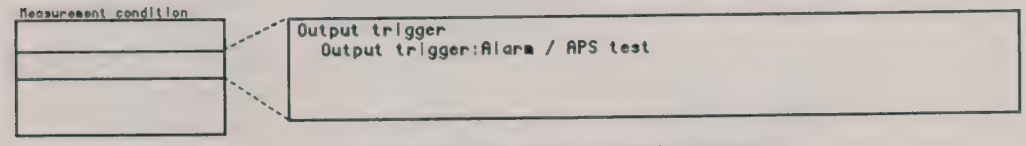


Fig. 5.8-81 Trigger output setting screen

Note: The setting of following items needs electrical option-25 or 26.
- TU PTR change, +PJC, -PJC
- Multi-frame pulse
- Pointer seq. test

[Related items] The following items are affected.

Route setting	:	Unit, Format
Test pattern	:	Information pattern/Frame
Pointer sequence test		

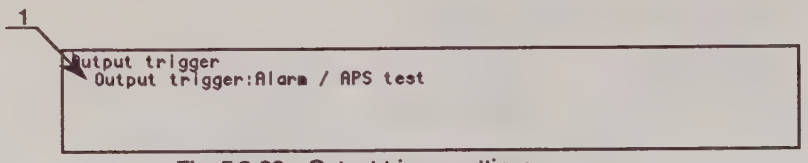


Fig. 5.8-82 Output trigger settings

Output trigger — Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]		
	OFF	: Does not output trigger
	Alarm / APS test	: Outputs at alarm addition time
	Bit error	: Outputs at Bit error addition time
	Parity / FEBE error	: Outputs at Parity/FEBE error addition time
	AU PTR change	: Outputs at pointer change time except PJC
	AU PTR +PJC	: Outputs at +PJC
	AU PTR −PJC	: Outputs at -PJC
	TU PTR change	: Outputs at pointer change time except PJC
	TU PTR +PJC	: Outputs at +PJC
	TU PTR −PJC	: Outputs at -PJC
	Info. PRBS sync.	: Outputs at max. 0s consecutive of PRBS signal
	Frame pulse	: Outputs at SOH 1 row generation time
	Multi-frame pulse	: Outputs synchronized frame at Multi-frame
	Pointer seq. test	: Outputs at Pointer sequence test execution time

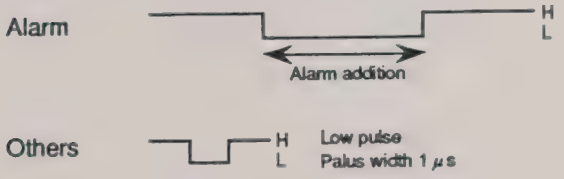
Note: Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range							
	Parity FEBE	AU PTR	TU PTR	PRBS sync.	Frame pusle	M-frame pulse	PTR seq. test	Others
Through	×	×	×	×	×	×	×	○
Repl. RSOH	○	×	×	×	○	×	×	○
STM0(52M) STM1	○	×	×	×	○	×	×	○
Except above	○	○*1	○*2	○*3	○	○*4	○*5	○

○ : Settable

*1 : This cannot be set when the Pointer setting is Pointer seq. test (Type:AU PTR)
*2 : This cannot be set when the Pointer setting is Pointer seq. test (Type:TU PTR)
*3 : This can be set only when the Info. pattern of test pattern is PRBS pattern
*4 : This can be set only when the Unit of Route setting is VC11, VC11(TU12) or VC12
*5 : This can be set only when the Pointer setting is Pointer seq. test

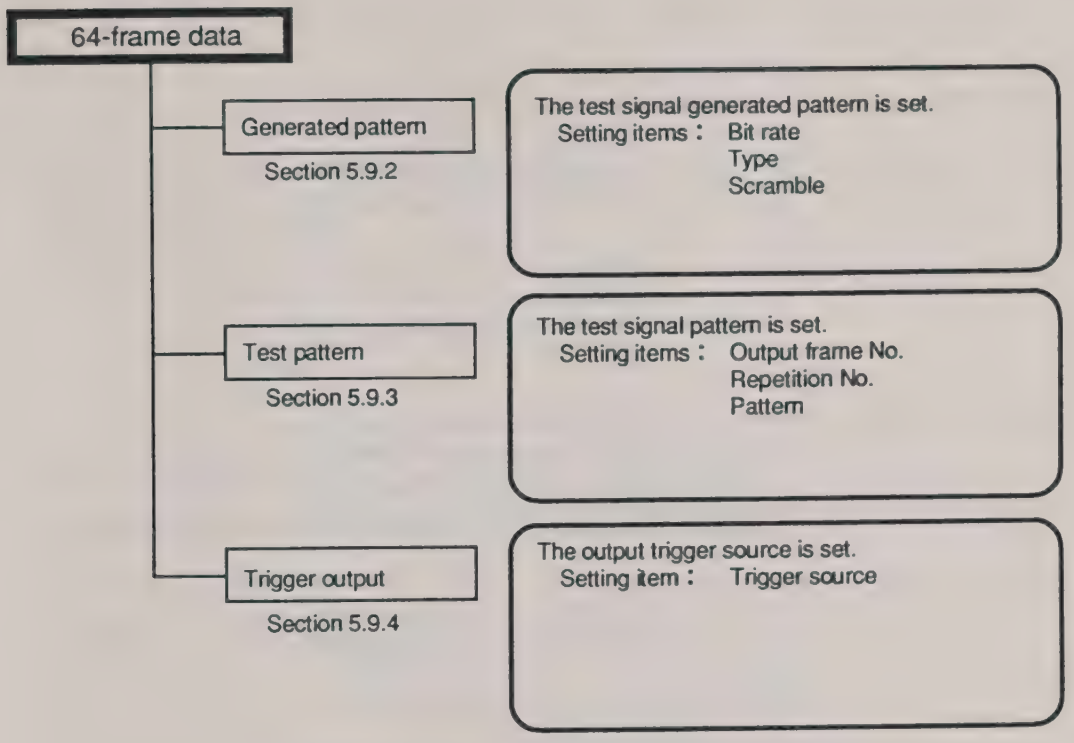
■Trigger signal



5. 9 Setting 64-Frame data

5. 9. 1 List of functions

The edited frame data is output.
The 64-frame data functions are listed below.



Note: 64-frame data can be set when electrical option-31 or 32 is instaled.

5. 9. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The setting can be performed on the following screen.

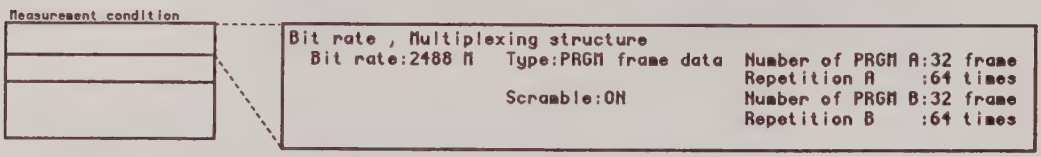


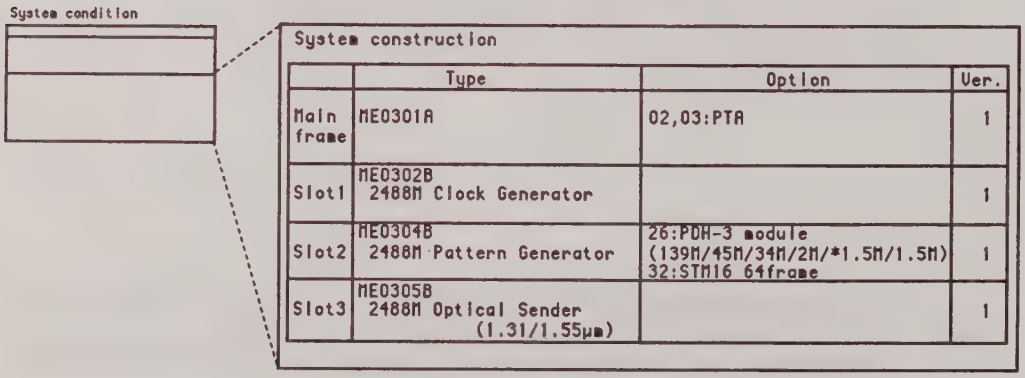
Fig. 5.9-1 Generated pattern setting screen

[Related items] The following items are affected.

Equipment name : ME3520A／ME3620A

Option condition : Presence/absence of Electrical option-31 or 32

However, the option condition can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302B 2488M Clock Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.9-2 Related screen

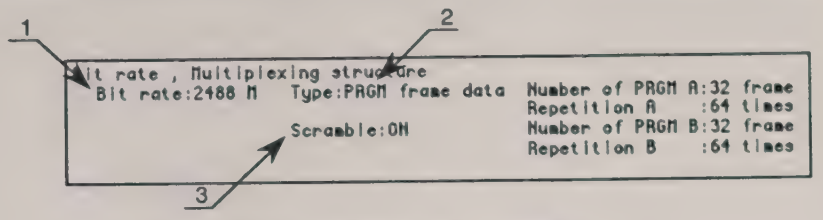


Fig. 5.9-3 Generated pattern settings

Bit rate Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings. (→ See section 5.11)

Type Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range] PRGM frame data

Note:
1. PRGM frame data can be set when electrical option-31 or 32 is installed.
2. When the Type 2 was changed other state for PRGM frame data or Bit rate 1 was changed, according to the Bit rate 1 the key operations and screen modification within following seconds become invalid. Therefore, be careful to change the Bit rate and succeeding procedure.
   - 52 M : Approx. 1 sec
   - 156 M : Approx. 2 sec
   - 622 M : Approx. 4 sec
   - 2488 M : Approx. 15 sec

Scramble Sets the Scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 9. 3 Setting test pattern

The test signal pattern is set here.

[Setting items] The following items can be set.

- Output control
  - Frame No.
  - Repetition No.
- Pattern settings

[Operation screen] The settings can be performed on the following screen.

- Output control

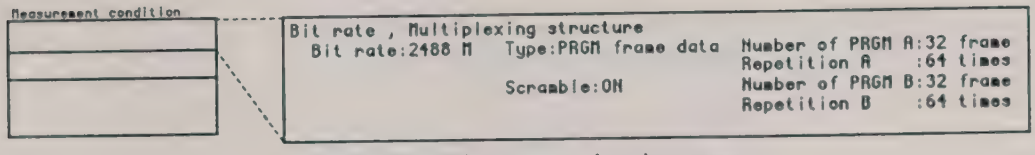


Fig. 5.9-4 Output control setting screen

- Pattern

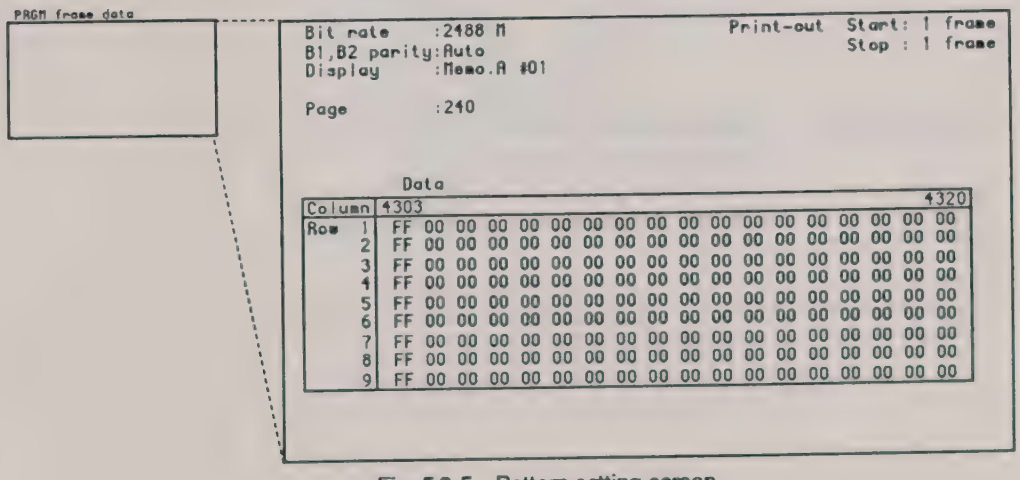


Fig. 5.9-5 Pattern setting screen

● Output control

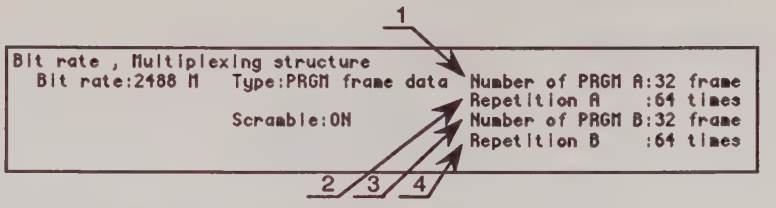


Fig. 5.9-6 Output control settings

Number of PRGM A

Sets the program frame No. of memory A at 1.
The setting range is as follows:

[Setting range] 1 ~ 32 / step 1

Repetition A

Sets the output repetition No. of memory A at 2.
The setting range is as follows:

[Setting range] 1 ~ 64 / step 1

Number of PRGM B

Sets the program frame No. of memory B at 3.
The setting range is as follows:

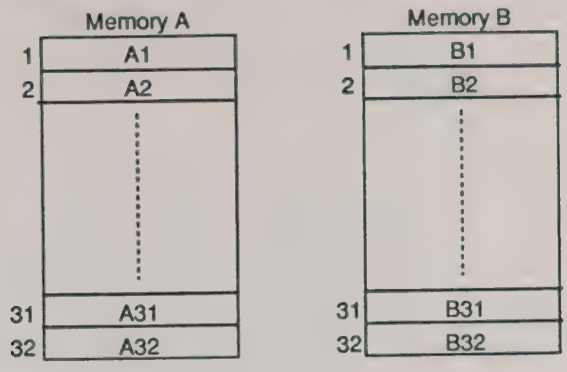
[Setting range] 1 ~ 32 / step 1

Repetition B

Sets the output repetition No. of memory B at 4.
The setting range is as follows:

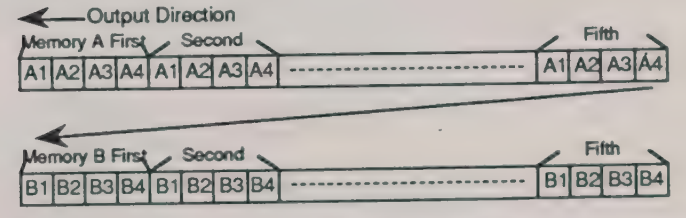
[Setting range] 1 ~ 64 /step 1

(Reference) The memory configuration and editing data output method are shown below.



<Output example>

Number of PRGM A : 4
Repetition A : 5
Number of PRGM B : 4
Repetition B : 5
} At data output



The four frames of memory A are output 5 times and the four frames of memory B are output 5 times. The output is repeated in this sequence.

● Pattern editing

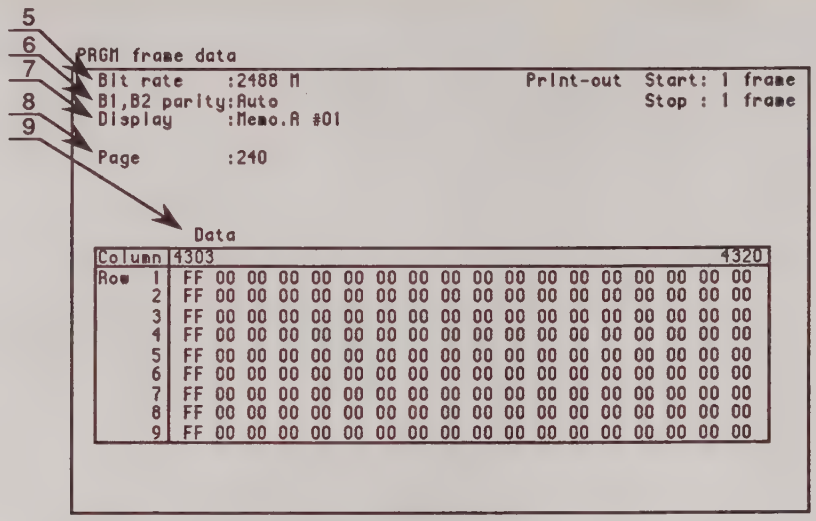


Fig. 5.9-7 Output pattern settings

Bit rate Sets the Bit rate performed pattern setting at 5.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note: Fixed the same value as Bit rate of generated pattern.

B1, B2 parity Sets the B1 and B2 calculation method at 6.
The setting range is as follows:

[Setting range] Auto : Calculates by hardware and Outputs
PRGM : Outputs set pattern in B1 and B2

Display memory Sets the editing memory type at 7.
The setting range is as follows:

[Setting range] Memo. A
Memo. B

Display #No. Sets the editing memory No. at 7.
The setting range is as follows:

[Setting range] 1 ~ 32 / step 1

Page Sets the editing page No. at 8.
The setting range is as follows:

[Setting range] 1 ~ 240 / step 1

Note: Setting range has following restrictions according to the Bit rate 5.

Bit rate	Setting range
52 M	1 ~ 5
156 M	1 ~ 15
622 M	1 ~ 60
2488 M	1 ~ 240

Data Sets the pattern at 9.
The setting range is as follows:

[Setting range] 00 ~ FF / step 1

5. 9. 4 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source	OFF
	Frame pulse

[Operation screen] The settings can be performed on the following screen.

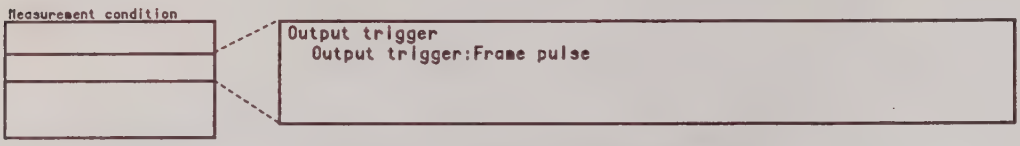


Fig. 5.9-8 Trigger output setting screen

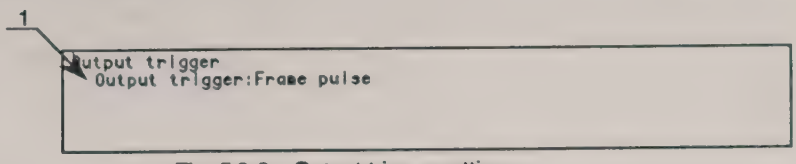


Fig. 5.9-9 Output trigger settings

Output trigger Sets the output trigger source at 1.
The setting range is as follows:

[Setting range] OFF : Does not output trigger
Frame pulse : Outputs at SOH 1 row generation time

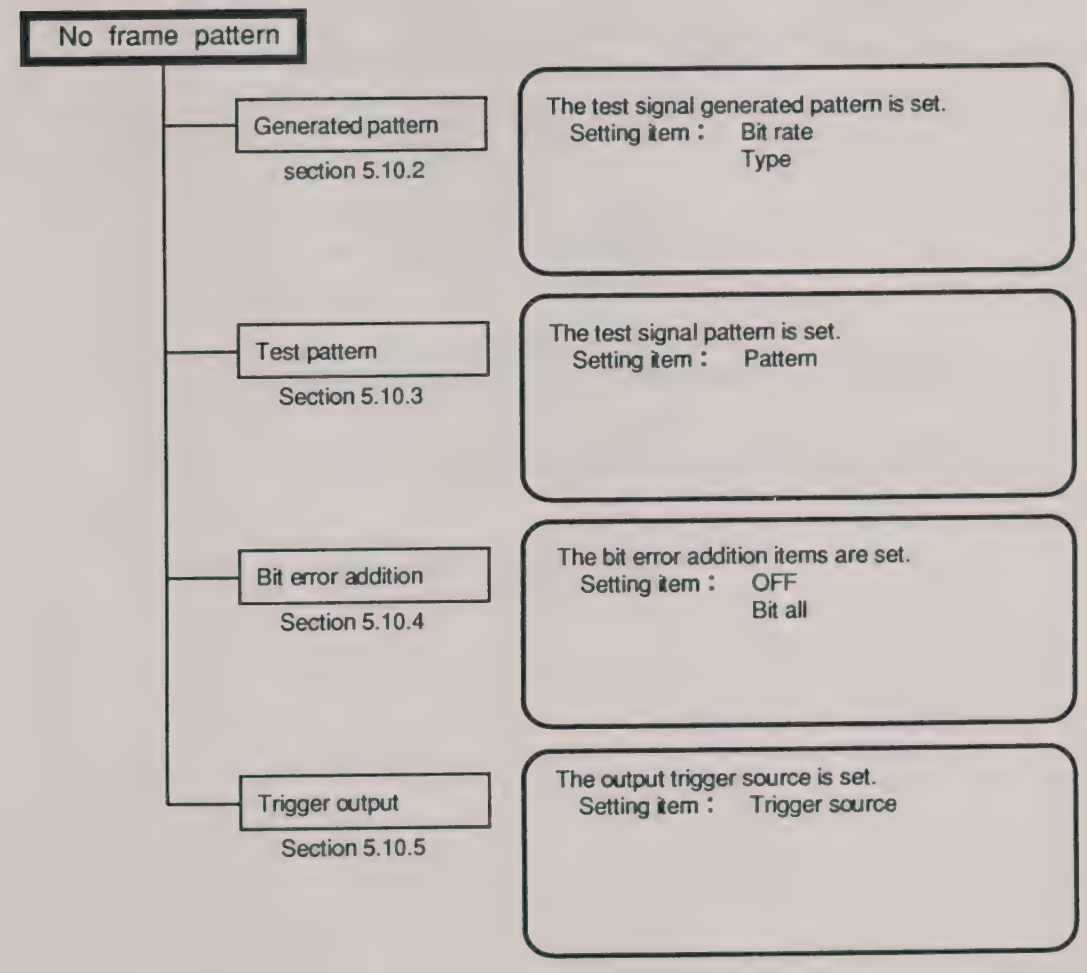
■Trigger signal

Frame pulse

5. 10 Setting No frame pattern

5. 10. 1 List of functions

フレーム無しのシリアルデータを出力します。
No frame pattern における機能一覧を示します。



5. 10. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type

[Operation screen] The settings can be performed on the following screen.

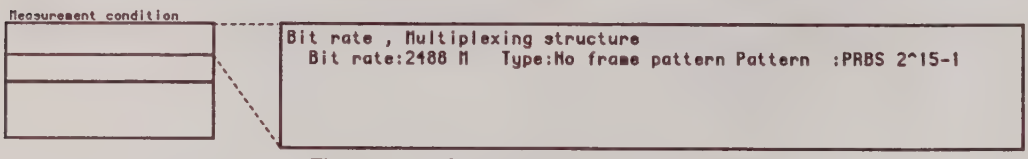


Fig. 5.10-1 Generated pattern setting screen

[Related items] The following item is affected.

Equipment name : ME3520A／ME3620A

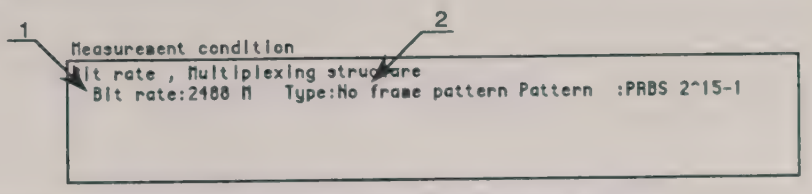


Fig. 5.10-2 Generated pattern settings

Bit rate Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Note:
1. 2488M can be set only ME3620A.
2. 139M, 34M, 2M and 1.5M are PDH settings (→ See section 5.11)

Type Sets the type of output signal at 2.
The setting range is as follows:

[Setting range] No frame pattern

5. 10. 3 Setting test pattern

The test signal pattern is set here.

[Setting items] The following item can be set.

- Pattern

[Operation screen] The settings can be performed on the following screen.

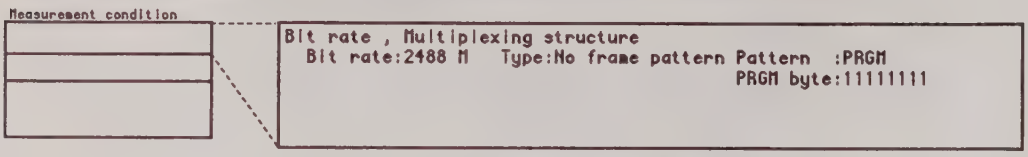


Fig. 5.10-3 Payload setting screen

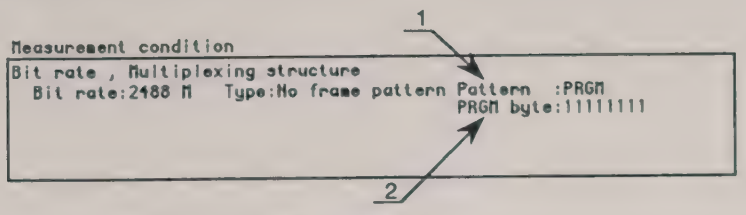


Fig. 5.10-4 Pattern settings

Pattern — Sets the output pattern at 1.
The setting range is as follows:

[Setting range]
- PRBS 2^7-1
- PRBS 2^9-1
- PRBS 2^11-1
- PRBS 2^15-1
- PRBS 2^20-1
- PRBS 2^23-1
- PRGM
- 1/8
- 7/8
- all 0
- all 1

PRGM byte — Sets any 8-bit arbitrary pattern at 2.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 ／bit-pattern settings

Note: PRGM byte 2 can be set when the Info. pattern 1 is PRGM.

5. 10. 4 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF

All areas : Bit all

Bit error add

[Operation screen] The settings can be performed on the following screen.

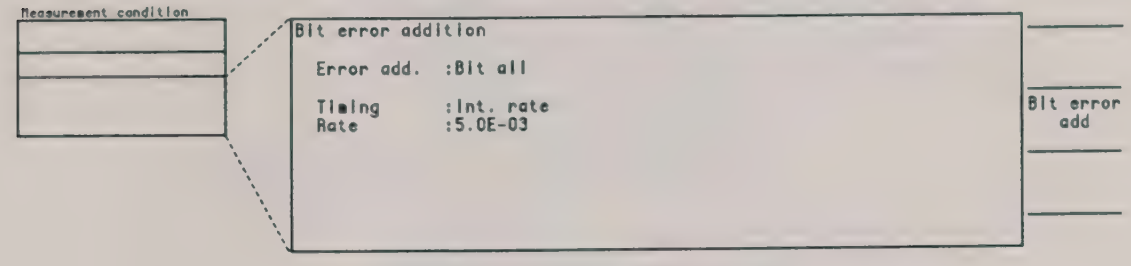


Fig. 5.10-5 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

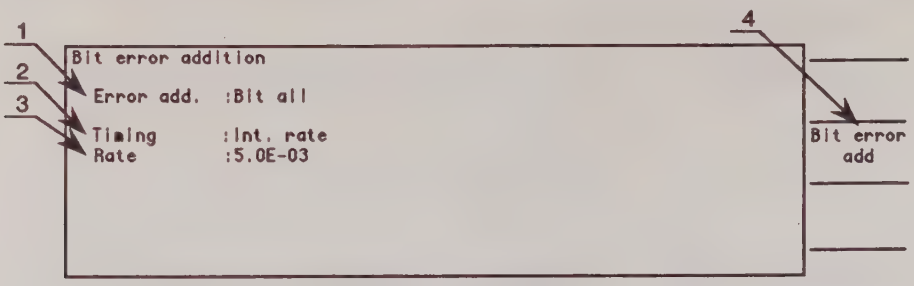


Fig. 5.10-6 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range] OFF : Does not add error
Bit all : Adds error all areas of signal

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range] Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
Int. rate : Adds error according to error rate
Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range] 5.0E-03
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
1.0E-09
1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 4 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of error item being added (Bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 10. 5 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source OFF
Bit error
Info. PRBS sync

[Operation screen] The settings can be performed on the following screen.

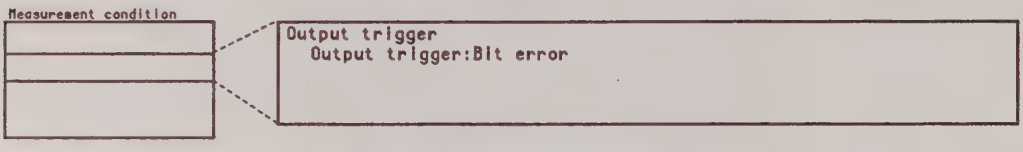


Fig. 5.10-7 Trigger output setting screen

[Related items] The following item is affected.

Test pattern : Pattern

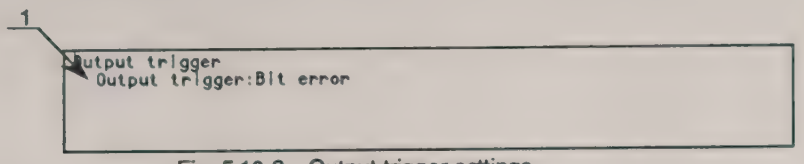


Fig. 5.10-8 Output trigger settings

Output trigger Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Bit error	: Outputs at Bit error addition time
Info. PRBS sync.	: Outputs at max. 0s consecutive of PRBS signal time

■Trigger signal

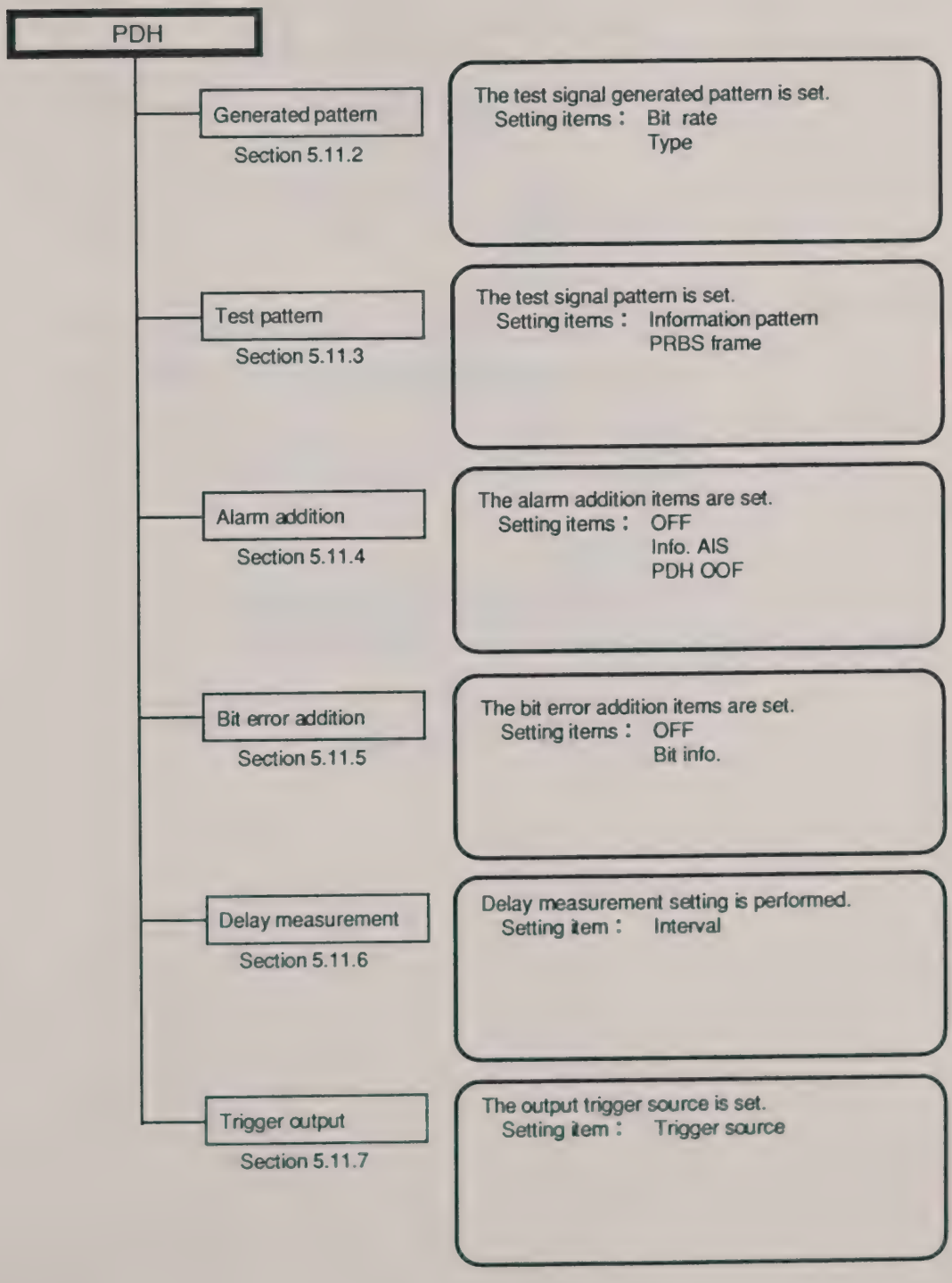
Low pulse
Pulse width 1 μs

Note: Info. PRBS sync. can be set when the Pattern of test pattern is PRBS pattern.

5. 11 Setting PDH pattern

5. 11. 1 List of functions

The asynchronous (stuff) interface signal is output.
The PDH functions are listed below.



5. 11. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type

[Operation screen] The settings can be performed on the following screen.

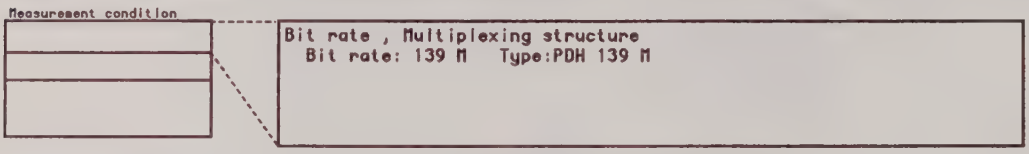
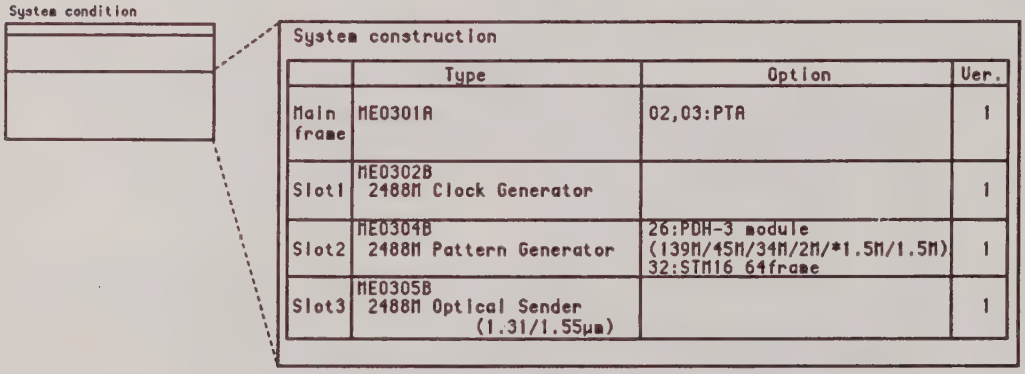


Fig. 5.11-1 Generated pattern setting screen

[Related items] The following item is affected.

Option condition : Presence/absence of Electrical option-25 or 26

However, the option condition can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302B 2488M Clock Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.11-2 Related screen

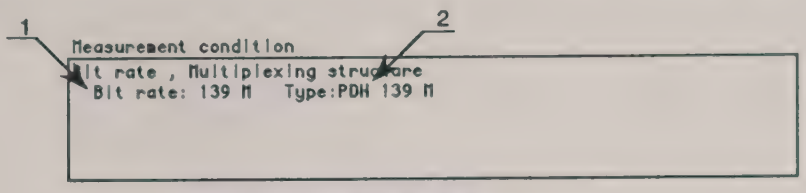


Fig. 5.11-3 Generated pattern

Bit rate — Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range]	139 M
	34 M
	2 M
	1.5 M

Type — Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range]	PDH	139 M
	PDH	34 M
	PDH	2 M
	PDH	1.5 M

Note: Type 2 is decided by the Bit rate 1.

5. 11. 3 Setting test pattern

The test signal pattern is set here.

[Setting items] The following items can be set.

- Information pattern
- PRBS frame

[Operation screen] The settings can be performed on the following screen.

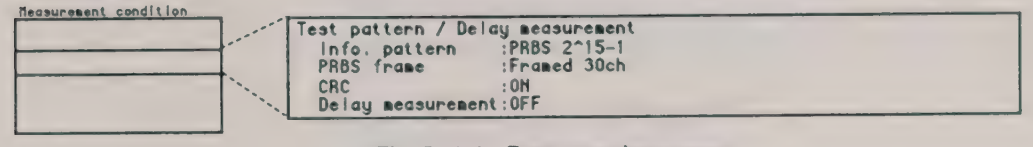


Fig. 5.11-4 Pattern setting screen

[Related items] The following item is affected.

Generated pattern : Bit rate

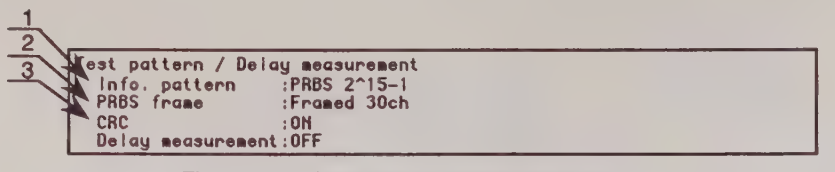


Fig. 5.11-5 Information pattern settings

Info. pattern Sets the Information pattern at 1.
The setting range is as follows:

[Setting range]
PRBS 2^15-1
PRBS 2^20-1
PRBS 2^20-1z
PRBS 2^23-1
all 0
all 1

Note: Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range			
	2^15-1	2^20-1	2^20-1z	2^23-1
139 M	○	×	×	○
34 M	○	○	×	○
2 M	○	○	×	○
1.5 M	○	○	○	○

○ : Settable

PRBS frame Sets the PRBS frame at 2.
The setting range is as follows:

[Setting range]
Unframed
Framed 30ch
Framed 31ch
Framed SF
Framed ESF

Note: Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range				
	Unframed	30ch	31ch	SF	ESF
139 M	Unsettable				
34 M					
2 M	○	○	○	×	×
1.5 M	○	×	×	○	○

○ : Settable

CRC Sets the CRC addition of PRBS frame at 3.
The setting range is as follows:

[Setting range] OFF : Not add
ON : Add

Note: CRC 3 can be set when the PRBS frame 2 is Framed 30ch or Framed 31ch.

5. 11. 4 Alarm addition

The alarm addition items are set here.

[Setting items] The following items can be set.

OFF
PDH OOF : PDH Out Of Frame
Info. AIS : Information Alarm Indication Signal

Alarm add

[Operation screen] The settings can be performed on the following screen.

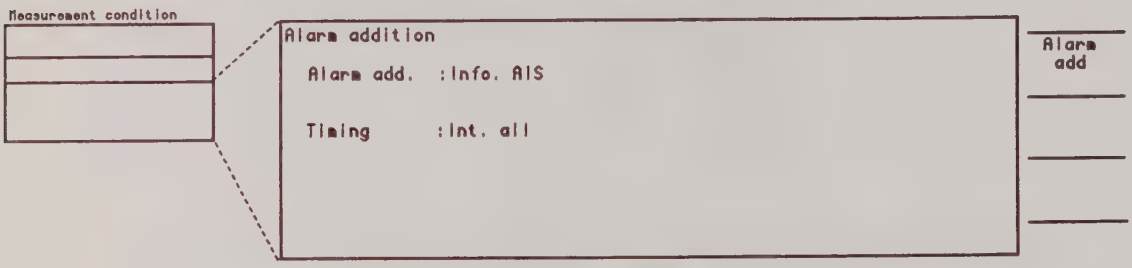


Fig. 5.11-6 Alarm addition screen

Note:
1. When the function key 'Alarm add' is OFF, the set alarm item is not enabled.
2. Alarm addition is not performed at the Delay measurement execution condition.

[Related items] The following item is affected.
Test pattern : PRBS frame

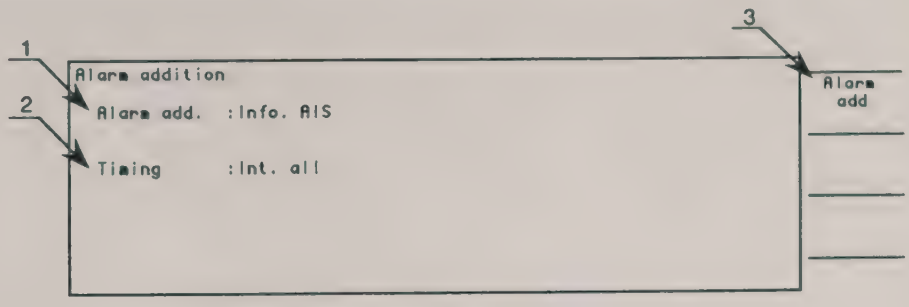


Fig. 5.11-7 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

[Setting range]		
	OFF	: Does not alarm addition
	PDH OOF	: Frame error
	Info. AIS	: Information set to all 1s

Note: PDH OOF can be set when the PRBS frame of test pattern is Framed.

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range]		
	Int. all	: Adds alarm every frame

Alarm add Controls the execution of Alarm addition by using 'Alarm add' function key at 3.
The setting range is as follows:

[Setting range]		
	Alarm add OFF	: Does no add alarm
	Alarm add ON	: Adds alarm

Note:
1. The Alarm add 3 is disable when the Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with the Timing 2. In addition, the LED of alarm item being added light on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' function key label is released from the reverse-display and the alarm is not added. In addition, the LED of alarm item being added go off on the front panel alarm section.

5. 11. 5 Bit error addition

The Bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF

Information area : Bit info.

Bit error add

[Operation screen] The settings can be performed on the following screen.

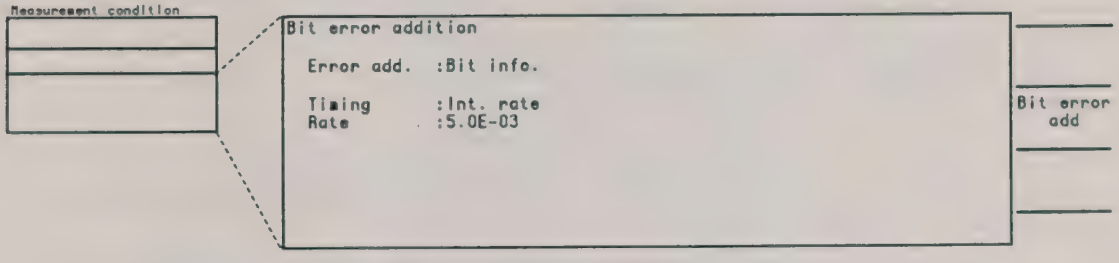


Fig. 5.11-8 Bit error addition screen

Note:

1. The set error item is not enabled when the 'Bit error add' function key is disabled.
2. Bit error addition cannot be performed at the Delay measurement execution condition.

[Related items] The following item is affected.

Test pattern : Info. pattern

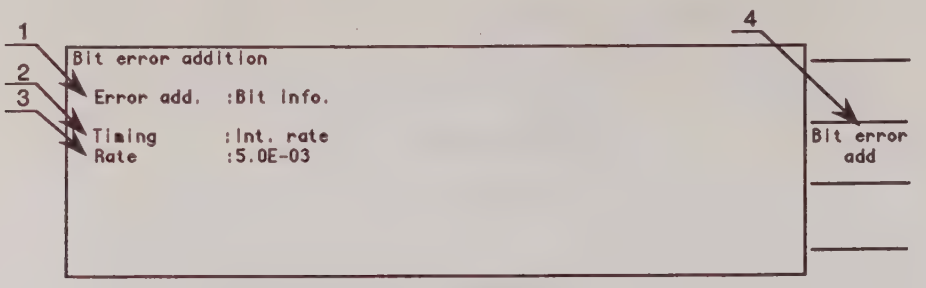


Fig. 5.11-9 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range] OFF : Does not add error
Bit info. : Adds arbitrary 1 bit error in PRBS area

Note: Bit info. can be set when Info. pattern of test pattern is PRBS pattern.

Timing Sets the addition timing at 2.
The setting range is as follows:

[Setting range] Int. single : Adds 1 bit error when 'Bit error add' key 4 pressed
Int. rate : Adds error according to error rate
Ext. single : Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate Sets the added error rate at 3.
The setting range is as follows:

[Setting range] 5.0E-03
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
1.0E-09
1.0E-10

Note: Rate 3 can be set when the Timing 2 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 4.
The setting range is as follows:

[Setting range] Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 4 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 2. In addition, the LED of error item being added (Bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 11. 6 Delay measurement

The item for Delay measurement is set here.

[Setting items] The following item can be set.

Interval	OFF
	0.5 sec
	1.0 sec
	2.0 sec
	5.0 sec
	10 sec

[Operation screen] The setting can be performed on the following screen.

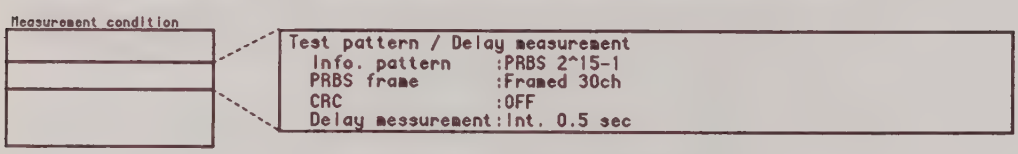


Fig. 5.11-10 Delay measurement

Note: At Delay measurement execution condition, the following items can be set.
Alarm addition
Bit error addition

[Related items] The following item is affected.
Trigger output is set to Delay measurement automatically.

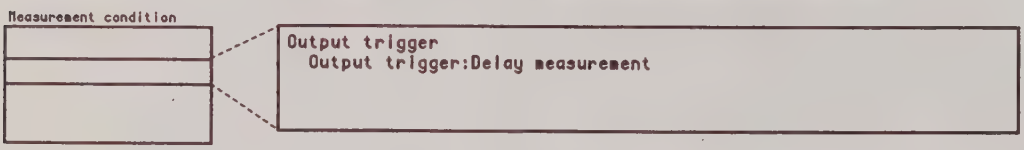


Fig. 5.11-11 Related screen

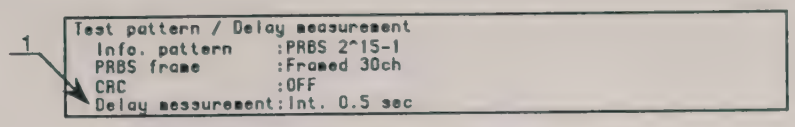


Fig. 5.11-12 Delay measurement settings

Delay measurement

Sets the output interval of signal for Delay measurement at 1.
The setting range is as follows:

[Setting range]
OFF
Int. 0.5 sec
Int. 1.0 sec
Int. 2.0 sec
Int. 5.0 sec
Int. 10 sec

5. 11. 7 Trigger output

The output trigger source is set here.

[Setting items] The following items can be set.

Trigger source
- OFF
- Alarm/APS test
- Bit error
- Info. PRBS sync
- Delay measurement

[Operation screen] The settings can be performed on the following screen.

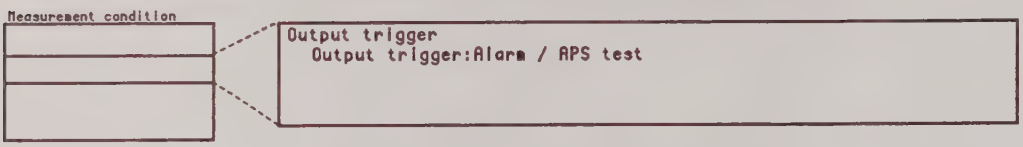


Fig. 5.11-13 Trigger output setting screen

[Related items] The following items are affected.

Test pattern : Info. pattern

Delay measurement

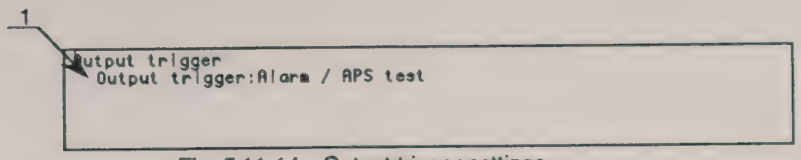


Fig. 5.11-14 Output trigger settings

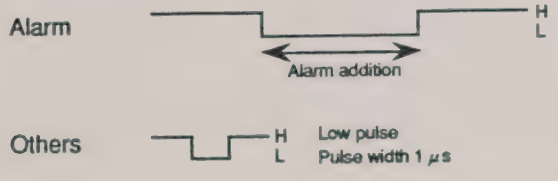
Output trigger

Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Alarm / APS test	: Outputs at alarm addition time
Bit error	: Outputs at Bit error addition time
Info. PRBS sync.	: Outputs at max. 0s consecutive of PRBS signal time
Delay measurement	: Outputs at Delay measurement start time

■Trigger signal

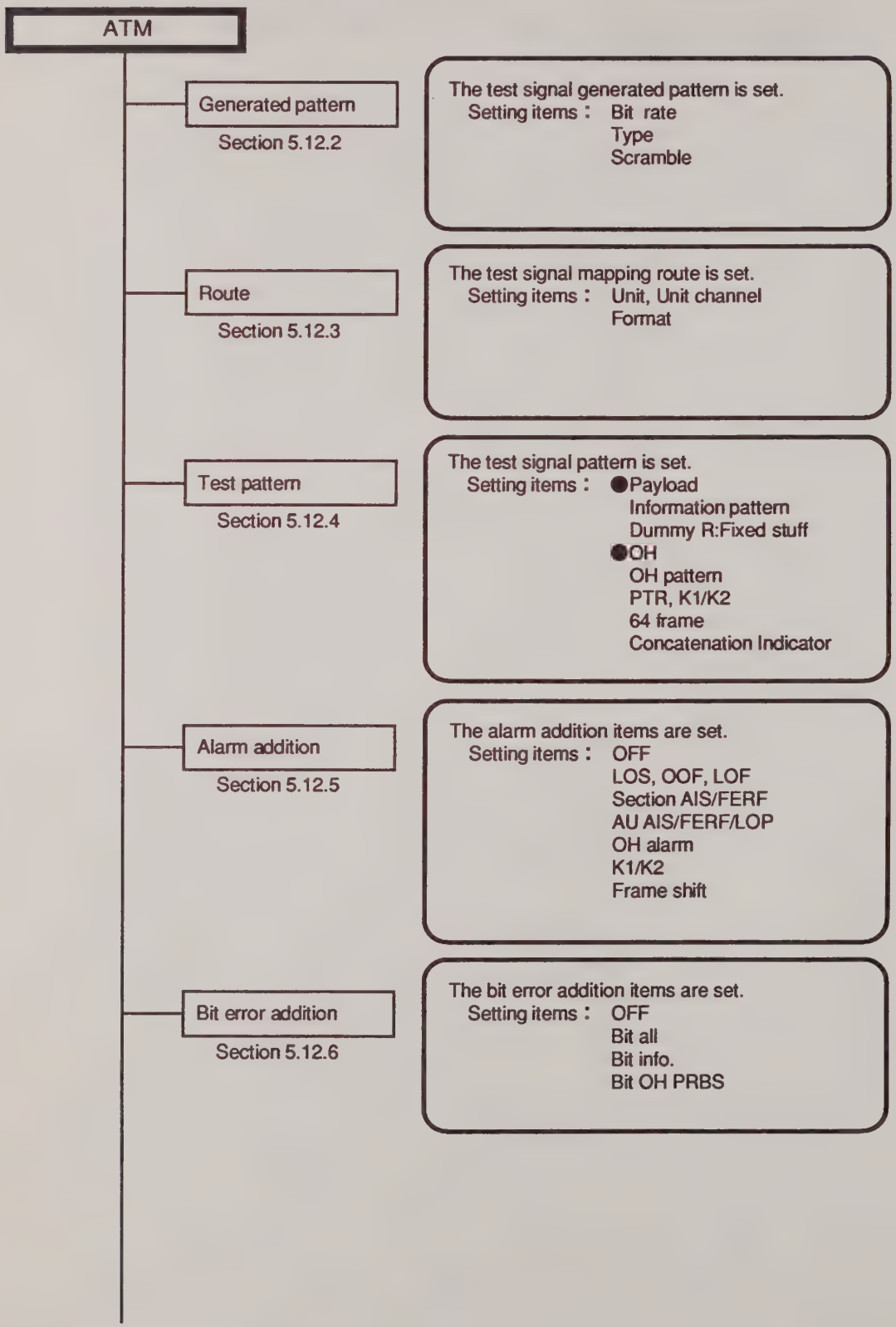


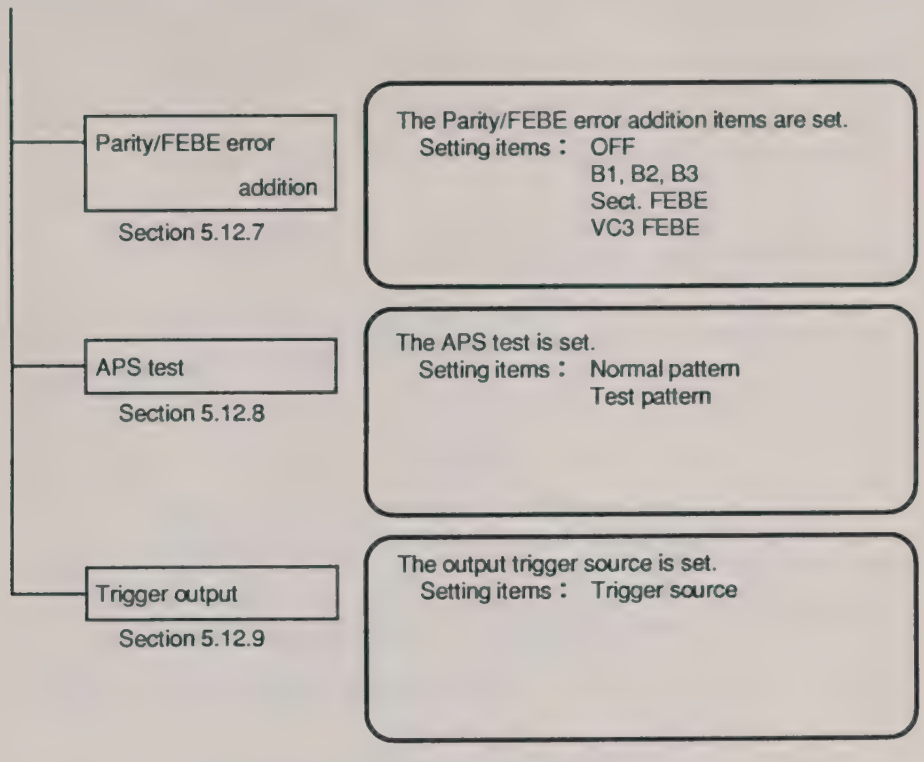
Note: Info. PRBS sync. can be set when the Info. pattern of test pattern is PRBS pattern.

5. 12 Setting ATM

5. 12. 1 List of function

External ATM signal is received, mapping to SDH format signal and outputting.
The ATM functions are listed below.


ATM
Generated pattern
Section 5.12.2
The test signal generated pattern is set.
Setting items : Bit rate
Type
Scramble
Route
Section 5.12.3
The test signal mapping route is set.
Setting items : Unit, Unit channel
Format
Test pattern
Section 5.12.4
The test signal pattern is set.
Setting items : ●Payload
Information pattern
Dummy R:Fixed stuff
●OH
OH pattern
PTR, K1/K2
64 frame
Concatenation Indicator
Alarm addition
Section 5.12.5
The alarm addition items are set.
Setting items : OFF
LOS, OOF, LOF
Section AIS/FERF
AU AIS/FERF/LOP
OH alarm
K1/K2
Frame shift
Bit error addition
Section 5.12.6
The bit error addition items are set.
Setting items : OFF
Bit all
Bit info.
Bit OH PRBS


Parity/FEBE error addition
Section 5.12.7
The Parity/FEBE error addition items are set.
Setting items : OFF
B1, B2, B3
Sect. FEBE
VC3 FEBE
APS test
Section 5.12.8
The APS test is set.
Setting items : Normal pattern
Test pattern
Trigger output
Section 5.12.9
The output trigger source is set.
Setting items : Trigger source

5. 12. 2 Setting generated pattern

The test signal generated pattern is set here.

[Setting items] The following items can be set.

- Bit rate
- Type
- Scramble

[Operation screen] The settings can be performed on the following screen.

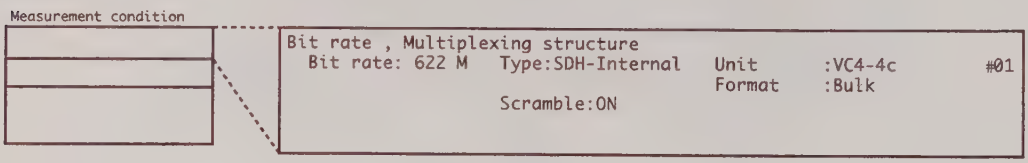
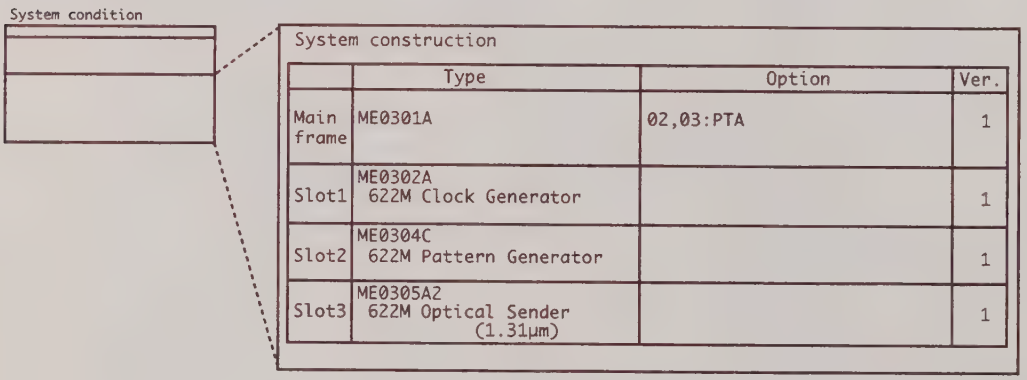


Fig. 5.12-1 Generated pattern setting screen

[Related items] The following item is affected.

Unit condition : Unit type inserted in Slot 2

However, the option condition can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0302A 622M Clock Generator		1
Slot2	ME0304C 622M Pattern Generator		1
Slot3	ME0305A2 622M Optical Sender (1.31μm)		1

Fig. 5.12-2 Related screen

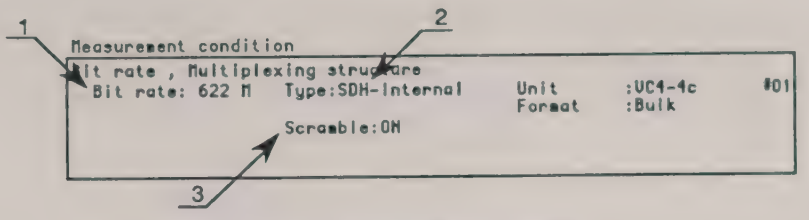


Fig. 5.12-3 Generated pattern settings

Bit rate

Sets the Bit rate of output signal at 1.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M

Note: When external ATM signal is Added, internal FIFO circuit reset is performed according to window Open/Close.

Type

Sets the Type of output signal at 2.
The setting range is as follows:

[Setting range] SDH-Internal

Scramble

Sets the scramble at 3.
The setting range is as follows:

[Setting range] OFF
ON

5. 12. 3 Setting route

The test signal mapping route is set here.

[Setting items] The following items can be set.

- Unit and Unit channel
- Format

[Operation screen] The settings can be performed on the following screen.

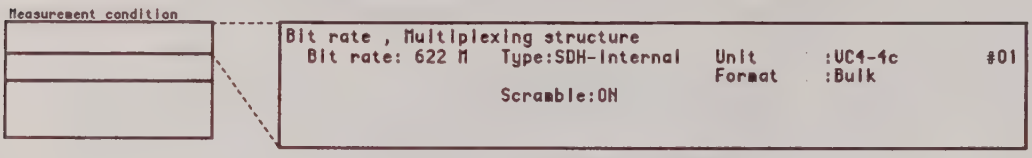


Fig. 5.12-4 Route setting screen

[Related items] The settable mapping route can be conformed at the following screen.

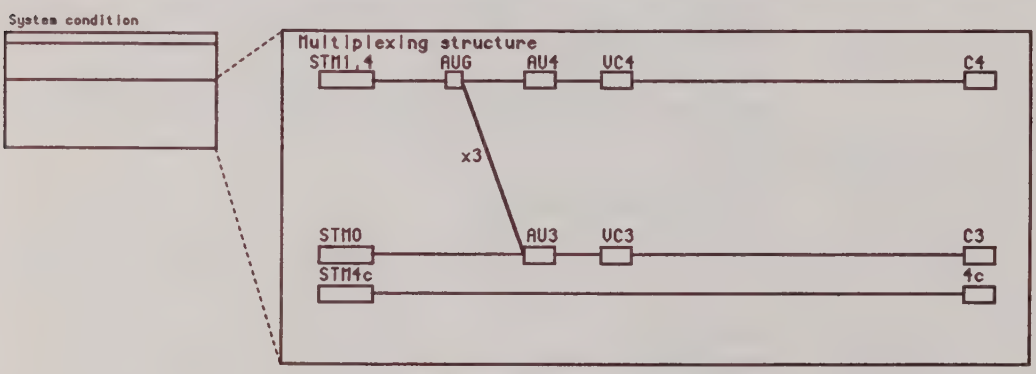


Fig. 5.12-5 Related screen

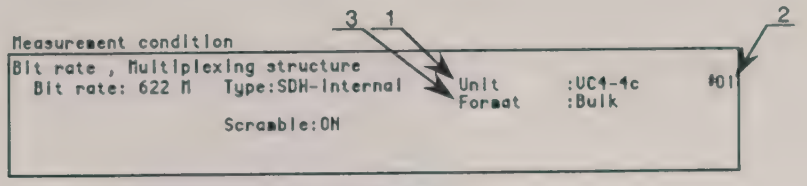


Fig. 5.12-6 Route settings

Unit Sets the Unit at 1.
The setting range is as follows:

[Setting range] VC3
VC4
VC4-4c

Note:

1. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	VC3
156 M	VC4
622 M	VC4-4c

2. When Unit set to except above, ATM measurement cannot be executed.

Unit Channel Sets the Unit Channel at 2.
The setting range is as follows:

[Setting range] #01

Format Sets the Format of Unit at 3.
The setting range is as follows:

[Setting range] Bulk

5. 12. 4 Setting test pattern

The test signal pattern is set here.

[Setting items]

The following items can be set.

- Payload settings
  - Information pattern
  - Dummy, R:Fixed stuff
- OH settings
  - SOH/POH Preset pattern
  - SOH/POH pattern SOH/POH
    PTR
    K1/K2
  - Concatenation indicator

[Operation screen]

The settings can be performed on the following screen.

- Payload settings

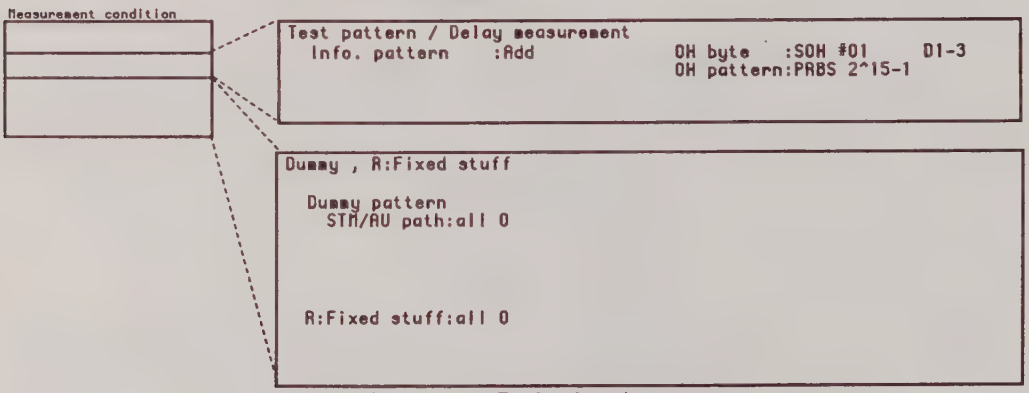


Fig. 5.12-7 Payload setting screen

- OH settings

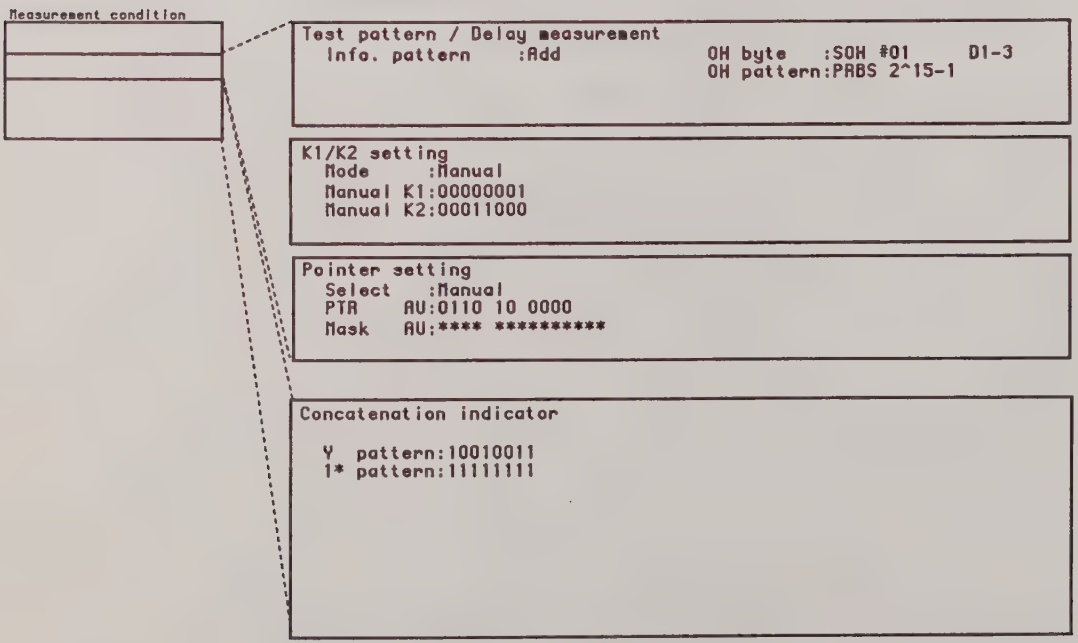


Fig. 5.12-8 OH setting screen

In addition, the following screens are available as pattern editing screen.

- PRGM SOH/POH preset data screen
- PRGM SOH 64-frame data screen
- PRGM POH 64-byte data screen
- PRGM pointer 64-frame data screen

[Related items] The following item is affected.

Generated pattern : Bit rate

Information pattern

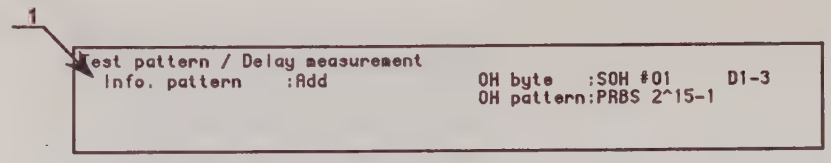


Fig. 5.12-9 Information pattern settings

Info. pattern Sets the Information pattern at 1.
The setting range is as follows:

[Setting range] Add

● Dummy／Stuff pattern

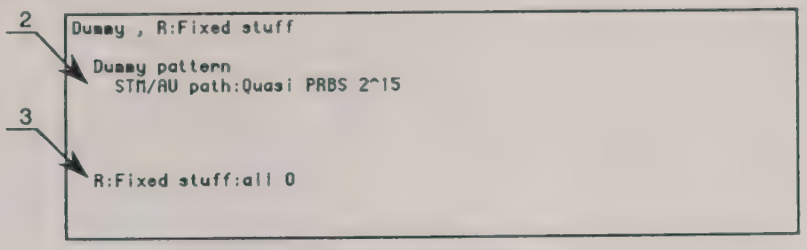


Fig. 5.12-10 Dummy/Stuff settings

STM／AU path　Sets the channel pattern except Unit channel in STM/AU path at 2.
The setting range is as follows:

[Setting range]　all 0
all 1
Quasi PRBS 2^15

R : Stuff　Sets the Stuff bit pattern inserted into payload at 3.
The setting range is as follows:

[Setting range]　all 0
all 1

● SOH/POH preset pattern

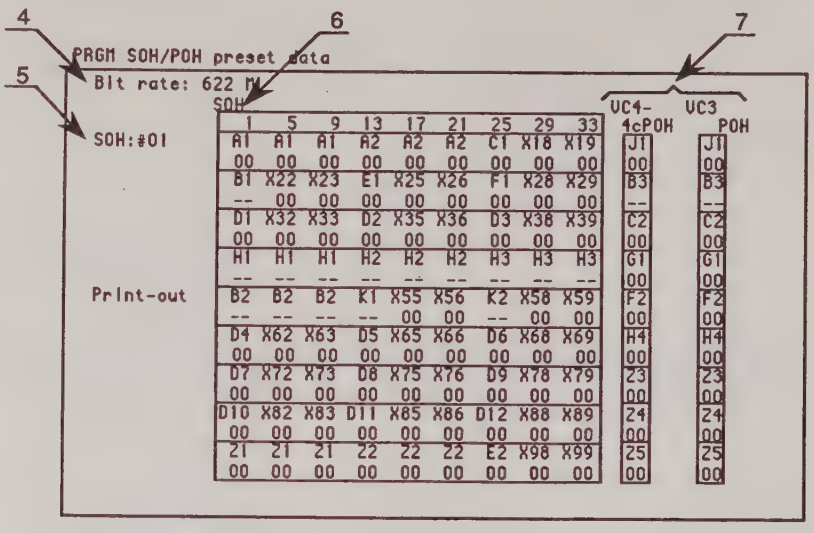


Fig. 5.12-11 Preset pattern settings

Bit rate — Sets the Bit rate performed pattern setting at 4.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M

Note: The pattern setting is possible for arbitrary Bit rate, but the output data with same Bit rate of generated pattern is effective.

SOH #No. — Sets the SOH No. performed pattern setting at 5.
The setting range is as follows:

[Setting range] #01 ~ #04 / step 1

Note: Setting range has following restrictions according to the Bit rate 4.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04

SOH pattern

Sets the SOH preset pattern at 6.
The setting range is as follows:

[Setting range] All bytes except K1/K2, H1/H2/H3, B1 and B2

POH pattern

Sets the POH preset pattern at 7.
The setting range is as follows:

[Setting range] All bytes except B3

Note: VC4 POH label is changed as follows according to the Bit rate 4.

Bit rate	POH label
52 M	Not display
156 M	VC4 POH
622 M	VC4-4c POH

<Restriction item> Outputted POH preset pattern is as follows according to the Bit rate of generated pattern and the Route setting.

Bit rate	POH output pattern	
	VC4	VC3
52 M	×	○
156 M	○	×
622 M	○	×

○ : Outputable

● SOH/POH pattern

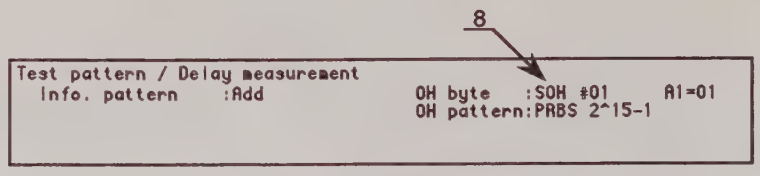


Fig. 5.12-12 SOH/POH pattern settings

Type — Sets the type of OH performed pattern setting at 8.
The setting range is as follows:

[Setting range] OFF
SOH
POH

Note: At OFF, the pattern setting is not performed to OH byte. In this case, outputs the SOH/POH preset pattern.

◆SOH(except K1/K2, PTR)

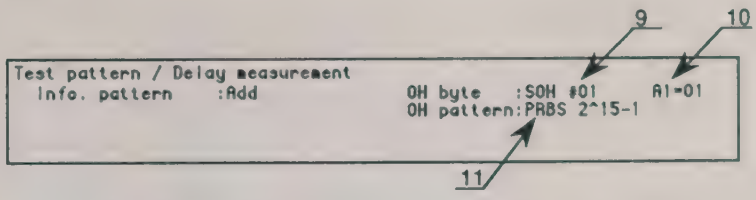


Fig. 5.12-13 SOH(except K1/K2, PTR) pattern settings

SOH #No. Sets the SOH No. performed pattern setting at 9.
The setting range is as follows:

[Setting range] #01 ~ #04 / step 1

Note:

1. SOH #No. 9 can be set when the Type 8 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04

SOH byte Sets the SOH byte performed pattern setting at 10.
The setting range is as follows:

[Setting range] 1 byte : All bytes except K1/K2, H1/H2/H3, B1 and B2
DCC(1-3) : 3 bytes of D1~D3
DCC(4-12) : 9 bytes of D4~D12

Note:

1. SOH byte 10 can be set when the Type 8 is SOH.
2. DCC(1-3) and DCC(4-12) can be set when the SOH #No. 9 is #01.

OH pattern

Sets the insert pattern to SOH at 11.
The setting range is as follows:

[Setting range]

Bit meas. OFF	:	Does not insert pattern
PRBS 2^11-1	:	Inserts PRBS pattern
PRBS 2^15-1	:	Inserts PRBS pattern
PRGM 64-frame	:	Inserts SOH 64-frame pattern
External	:	Inserts external pattern

Note:

1. At Bit meas. OFF, the SOH/POH preset pattern is outputted.
2. External cannot be set at Tracking ON.
   (Tracking setting sees section 5.17.4)

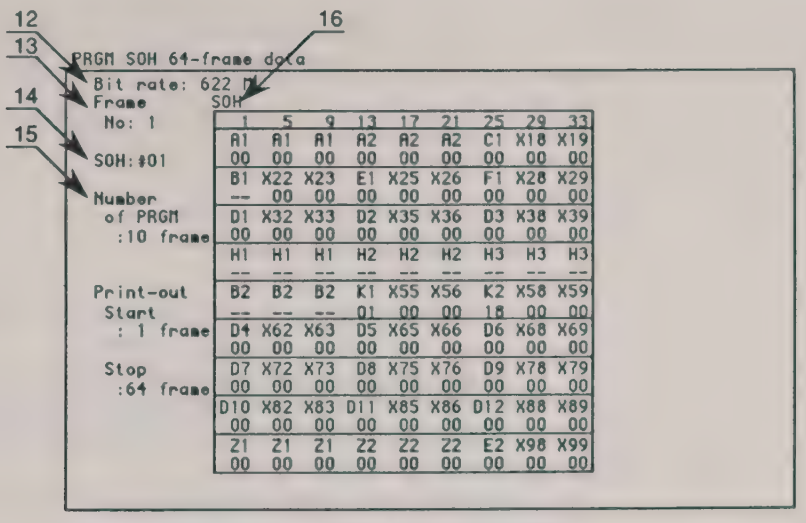


Fig. 5.12-14 PRGM 64-frame pattern

Bit rate Sets the Bit rate performed pattern setting at 12.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M

Frame No. Sets the frame No. performed editing at 13.
The setting range is as follows:

[Setting range] 1 ~ 64 / step 1

SOH #No. Sets the SOH No. performed editing at 14.
The setting range is as follows:

[Setting range] #01 ~ #04 / step 1

Note: Setting range has following restrictions according to the Bit rate 12.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04

Number of PRGM

Sets the output frame No. at 15.
The setting range is as follows:

[Setting range] 1 ~ 64 / step 1

SOH

Sets the SOH pattern at 16.
The setting range is as follows:

[Setting range] All bytes except H1/H2/H3, B1 and B2

Note: PRGM 64-frame pattern is effective when OH pattern 11 is PRGM 64-frame, and outputs the pattern of Bit rate 12 same as the Bit rate of generated pattern.

◆K1/K2

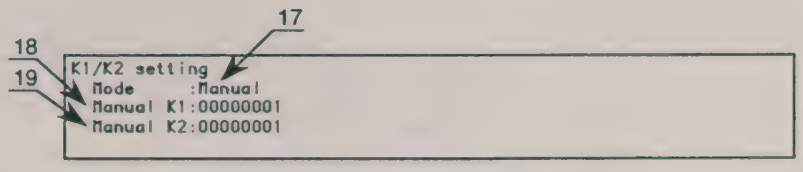


Fig. 5.12-15 K1/K2 pattern settings

Mode — Sets the K1/K2 setting mode at 17.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting
External : External pattern inserting
APS test : Automatic Protection Switching

Note:
1. External cannot be set when the OH pattern 11 is External.
2. APS test sees section 5.12.8 APS test.

Manual K1
Manual K2 — Sets the K1/K2 arbitrary pattern at 18 and 19.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

Note: Pattern 18 and 19 can be set when the Mode 17 is Manual.

◆ポインタ

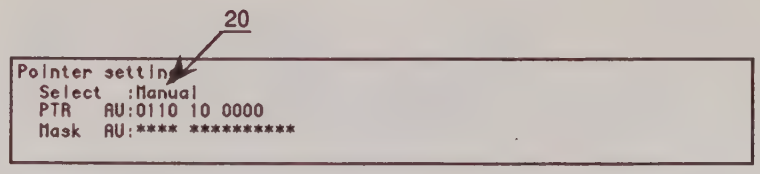


Fig. 5.12-16 Pointer pattern settings

Select Sets the pointer setting mode at 20.
The setting range is as follows:

[Setting range] Manual : Arbitrary pattern setting
PRGM 64-frame : Consecutive setting

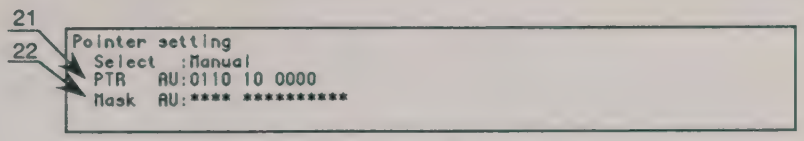


Fig. 5.12-17 Manual settings

PTR Sets the AU pointer pattern at 21.
The setting range and setting method are as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings
PTR : 0 ~ 1023 / step 1

[Setting method] Cursor sets on the pointer pattern 21, setting is possible by 2 types of method as follows:
(1) Setting using NDF
Open the window, sets pointer value.
(2) Setting using Justification
When Step up key pressed or Rotary encoder turn to the right, +Justification is generated, and when Step down key pressed or Rotary encoder turn to the left, −Justification is generated.

Mask Sets the Mask bit at 22.
The setting range is as follows:

[Setting range] NDF : **** ~ MMMM * : Not Mask
ID : ********** M : Mask
~ MMMMMMMMMM

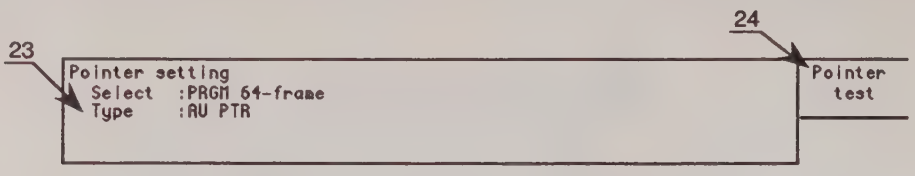


Fig. 5.12-18 PRGM 64-frame settings

Type — Sets the type of pointer performed 64-frame setting at 23.
The setting range is as follows:

[Setting range] AU PTR

Pointer test — Sets the output control using function key at 24.
The setting range is as follows:

[Setting range] Pointer test OFF : Does not set pattern
Pointer test ON : Sets pattern

Note: In the case of Pointer test ON, data set 'PRGM pointer 64-frame data' is outputted, but in the case of Pointer test OFF, data set Manual 21, 22 is outputted.

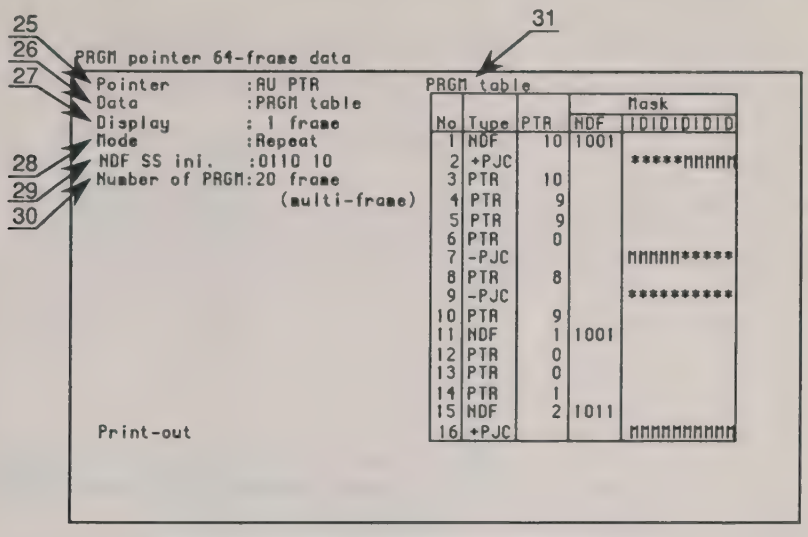


Fig. 5.12-19 PRGM 64-frame pattern settings

Pointer Sets the type of pointer performed pattern setting at 25.
The setting range is as follows:

[Setting range] AU PTR

Number of PRGM Sets the output frame No. at 30.
The setting range is as follows:

[Setting range] 2 ~ 64 / step 1

Note: When the Mode 28 is Single, 64 cannot be set.

NDF SS ini. Sets the initial value of NDF and SS at 29.
The setting range is as follows:

[Setting range] NDF : 0000 ~ 1111 / bit-pattern settings
SS : 00 ~ 11 / bit-pattern settings

Mode Sets the action mode at 28.
The setting range is as follows:

[Setting range] Single
Repeat

PRGM table　Sets the PRGM pattern of pointer at 31.
The setting range is as follows:

[Setting range]　When Type is NDF,
PTR : 0 ~ 1023 / step 1
NDF : 0000 ~ 1111 / bit-pattern settings
When Type is PTR,
PTR : 0 ~ 1023 / step 1
When Type is +PJC or -PJC,
ID : ＊＊＊＊＊＊＊＊＊＊~
MMMMMMMMMM
＊ : Not Mask
M : Mask

Note: There are following restrictions in the pattern setting:
- No.1 can be set only NDF.
- The repeat point can be set only PTR.
- +PJC and -PJC cannot be set the consecutive setting.
- When the just before PTR value is 783 or more, +PJC and -PJC cannot be set.

Data　Sets the switch of display data at 26.
The setting range is as follows:

[Setting range]　PRGM table : Setting value
Memory : Setting value is spread to output pattern

Note: The Memory has following features:
- indicates that the reverse of ID bit is masked in +PJC/-PJC.
- ceeding data to frame No. of 'Number of PRGM 30' cannot be displayed.

PRGM table

No	Type	PTR	Mask NDF	Mask ID
1	NDF	10	1001	
2	+PJC			＊＊＊＊＊MMMMM
3	PTR	10		
4	PTR	9		
5	PTR	9		
6	PTR	0		
7	-PJC			MMMMM＊＊＊＊＊
8	PTR	8		
9	-PJC			＊＊＊＊＊＊＊＊＊＊
10	PTR	9		
11	NDF	1	1001	
12	PTR	0		
13	PTR	0		
14	PTR	1		
15	NDF	2	1011	
16	+PJC			MMMMMMMMMM

Memory

No	Output NDF	SS	Output ID	Internal JI	
1	1001	10	0000001010	10	NDF
2	0110	10	1010 0101C		+PJC
3	0110	10	0000001010	11	
4	0110	10	0000001001	9	PTR
5	0110	10	0000001001	9	PTR
6	0110	10	0000000000	0	PTR
7	0110	10	0000010101		-PJC
8	0110	10	0000001000	782	
9	0110	10	0110100100		+PJC
10	0110	10	0000001001	0	
11	1001	10	0000000001	1	NDF
12	0110	10	0000000000	0	PTR
13	0110	10	0000000000	0	PTR
14	0110	10	0000000001	1	PTR
15	1011	10	0000000010	2	NDF
16	0110	10	0000000001C		+PJC

Fig. 5.12-20　Data displayings

Display — Sets the head position of data display at 27.
The setting range is as follows:

[Setting range] 1 ~ 49 / step 1

Note: When the Mode 28 is Single, 49 cannot be set.

◆POH

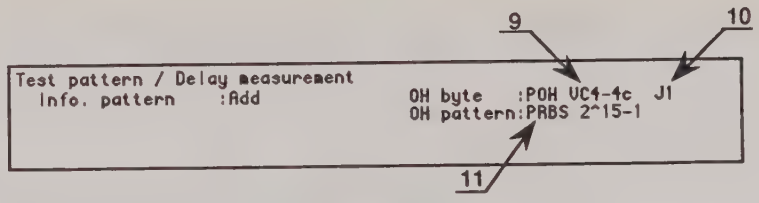


Fig. 5.12-21 POH settings

POH type

Sets the type of POH performed pattern setting at 9.
The setting range is as follows:

[Setting range] VC4-4c
VC4
VC3

Note:

1. POH type 9 can be set when the Type 8 is POH.
2. Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range
VC3	VC3
VC4	VC4
VC4-4c	VC4-4c

POH byte

Sets the POH byte performed pattern setting at 10.
The setting range is as follows:

[Setting range] All bytes except B3

Note:

POH byte 10 can be set when the Type 8 is POH.

OH pattern

Sets the POH pattern at 11.
The setting range is as follows:

[Setting range]
Bit meas. OFF : Does not insert pattern
PRBS 2^11-1 : Inserts PRBS pattern
PRBS 2^15-1 : Inserts PRBS pattern
PRGM 64-byte : Inserts POH 64-frame pattern
External : Inserts external pattern

Note:

1. At Bit meas. OFF, the SOH/POH preset pattern is outputted.
2. External cannot be set at Tracking ON.
   (Tracking setting sees section 5.17.4)

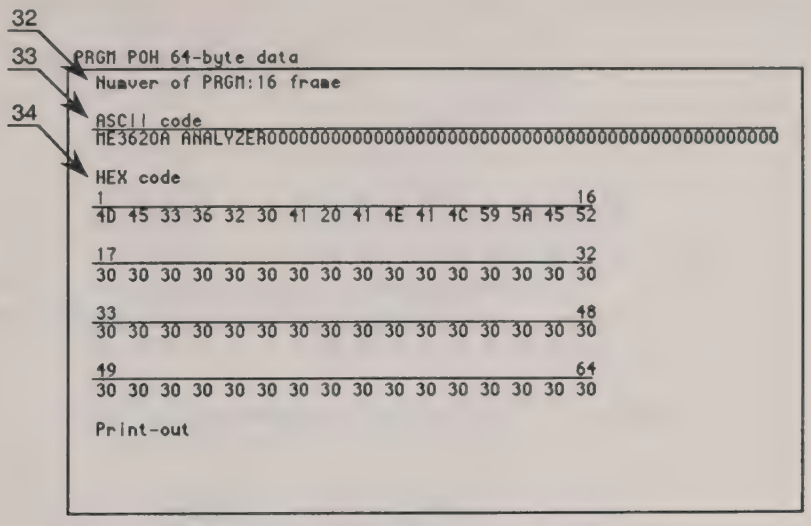


Fig. 5.12-22 PRGM 64-byte pattern settings

Number of PRGM Sets the output frame No. at 32.
The setting range is as follows:

[Setting range] 2 ~ 64 / step 1

ASCII code Sets the POH pattern (ASCII code) at 33.
The setting range is as follows:

[Setting range] 00 ~ FF by ASCII code

HEX code Sets the POH pattern (HEX code) at 34.
The setting range is as follows:

[Setting range] 00 ~ FF / step 1

● Concatenation Indicator

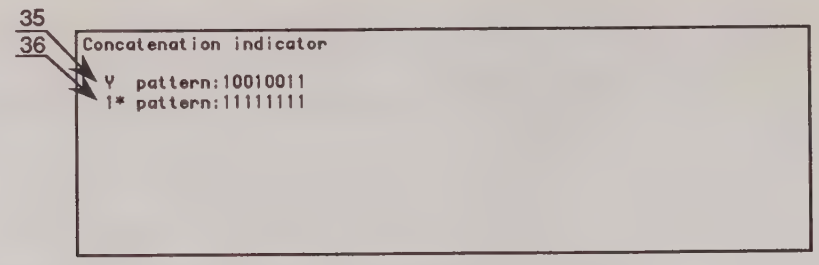


Fig. 5.12-23 Concatenation pattern settings

Y pattern — Sets the Y byte in AU pointer at 35.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

1 * pattern — Sets the 1 * byte in AU pointer at 36.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

5. 12. 5 Alarm addition

The alarm addition items are set here.

[Setting items] The following items can be set.

OFF		
LOS	:	Loss Of Signal
OOF	:	Out Of Frame
LOF	:	Loss Of Frame
Sect. AIS	:	Section Alarm Indication Signal
Sect. FERF	:	Section Far End Receive Failure
AU AIS	:	AU Alarm Indication Signal
AU LOP	:	AU Loss Of Pointer
AU FERF	:	AU Far End Receive Failure
OH alarm		
K1/K2		
Frame shift		
Alarm add		

[Operation screen] The settings can be performed on the following screen.

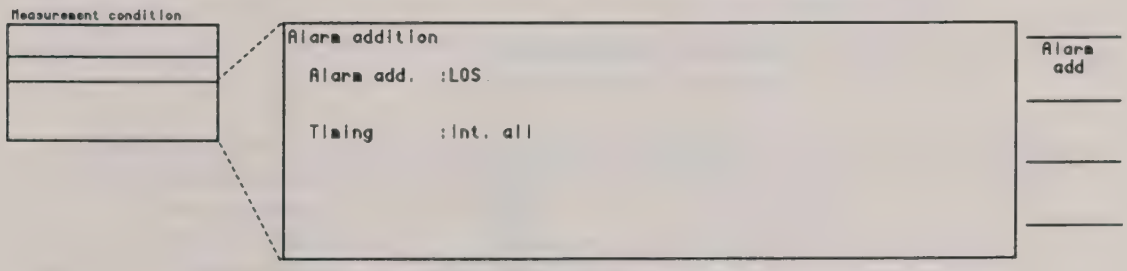


Fig. 5.12-24 Alarm addition screen

Note:
1. When the function key ' Alarm add' is OFF, the set alarm item is not enabled.
2. Alarm addition is not performed at the APS test execution condition.

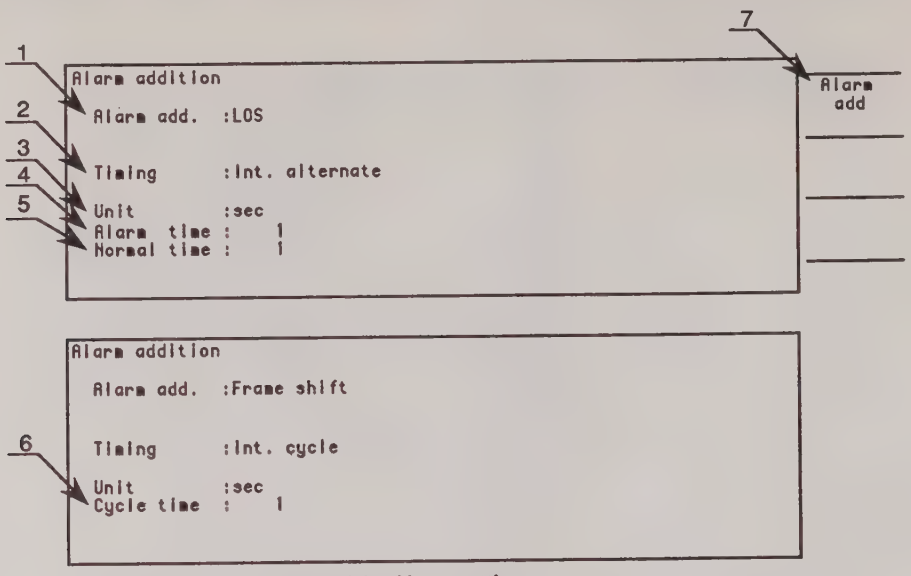


Fig. 5.12-25 Alarm settings

Alarm add. Sets the alarm addition item at 1.
The setting range is as follows:

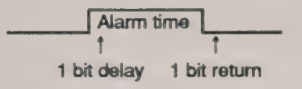
[Setting range]		
	OFF	: Does not alarm addition
	LOS	: Sets output signal interrupt
	OOF	: Frame sync loss
	LOF	: Frame sync loss
	Sect. AIS	: All bits except SOH 1~3 row set to all 1s
	Sect. FERF	: K2 b6~b8 set to '110'
	AU AIS	: AU level set to all 1s
	AU LOP	: AU PTR set to out of range
	AU FERF	: G1 b5 set to '1'
	OH alarm	: Alarm pattern set to arbitrary byte in OH
	K1/K2	: Alarm pattern set to K1/K2
	Frame shift	: 1 bit shift

Timing Sets the addition timing at 2.
The setting range is as follows:

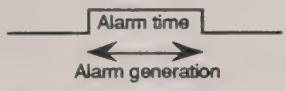
[Setting range]
Int. single
Int. cycle
Int. all
Int. alternate
Ext. gate

■Control signal

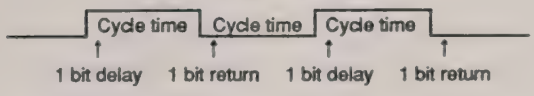
Int. single — Frame shift



Except above

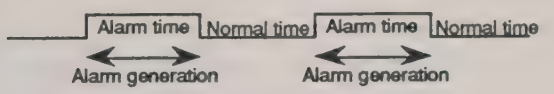


Int. cycle



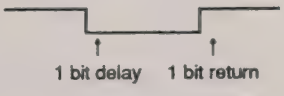
Int. all — Adds every frame

Int. alternate

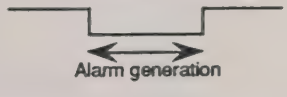


Ext. gate — Adds according to the Input signal from Control Input Alarm/Trigger connector

Frame shift



Except above



Note: Setting range has following restrictions according to the Alarm add. 1.

Alarm add.	Setting range				
	Int. single	Int. cycle	Int. all	Int. alternate	Ext. gate
Frame shift	○	○	×	×	○
Except above	○	×	○	○	○

○ : Settable

Unit — Sets the Unit of addition time at 3.
The setting range is as follows:

[Setting range]
Frame
μsec
msec
sec

Note:
1. Unit 3 can be set when the Timing 2 is Int. single or Int. alternate.
2. Setting range has following restrictions according to the Alarm add. 1. (see next page table)

Alarm time Sets the alarm addition time at 4.
The setting range is as follows:

[Setting range] See following table

Normal time Sets the alarm no addition time at 5.
The setting range is as follows:

[Setting range] See following table

Cycle time Sets the execution time of Frame shift at 6.
The setting range is as follows:

[Setting range] See following table

Alarm add.	Alarm time / Normal time / Cycle time Setting range			
	Frame	μsec	msec	sec
LOS	Unsettable	5 ~ 99875 /5	1 ~ 8000 /1	1 ~ 8 /1
OOF	1 ~ 23 /1	125 ~ 2875 /125	1 ~ 2 /2	Unsettable
LOF	24 ~ 40000 /1	Unsettable	3 ~ 8000 /1	1 ~ 8 /1
Sect. AIS	1 ~ 40000 /1	125 ~ 99875 /125	1 ~ 8000 /1	
Sect. FERF				
AU AIS				
AU LOP				
AU FERF				
OH alarm				
K1/K2				
Frame shift				

Alarm add Controls the execution of Alarm addition by using 'Alarm add' function key at 7.
The setting range is as follows:

[Setting range] Alarm add OFF : Does no add alarm
Alarm add ON : Adds alarm

Note:

1. The Alarm add 7 is disable when the Alarm add. 1 is OFF.
2. When the Alarm add is ON, the 'Alarm add' function key label is reverse-displayed and the alarm item being set is added in accordance with the Timing 2. In addition, the LED of alarm item being added light on the front panel alarm section.
3. When the Alarm add is OFF, the 'Alarm add' function key label is released from the reverse-display and the alarm is not added. In addition, the LED of alarm item being added go off on the front panel alarm section.

● OOF/LOF

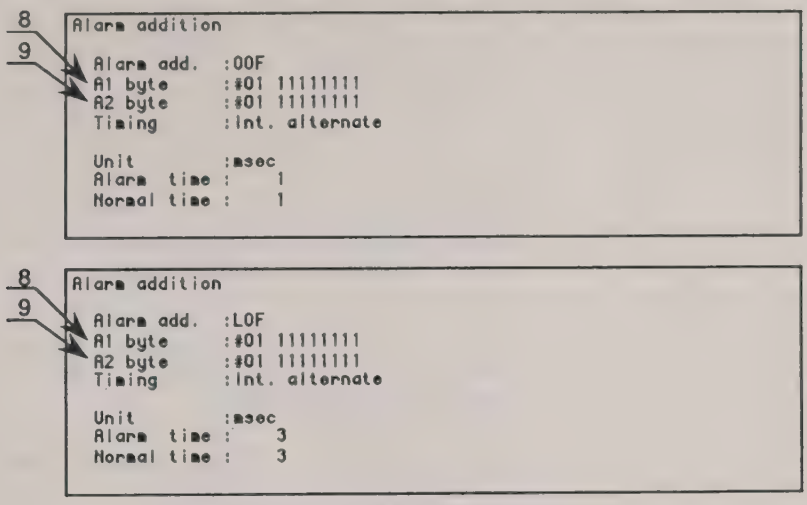


Fig. 5.12-26 OOF/LOF settings

A1 byte
A2 byte

Sets the byte position and alarm pattern of A1/A2 byte at 8 and 9.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ~ #12 / step 1
◆Pattern
00000000 ~ 11111111
/ bit-pattern settings

Note: Setting range of byte position has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01 ~ #03
622 M	#01 ~ #12

● AU LOP

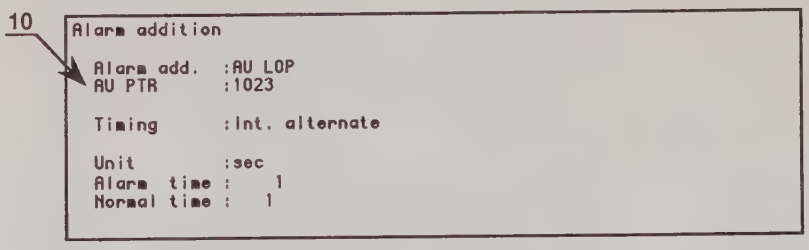


Fig. 5.12-27 AU LOP settings

AU PTR Sets the alarm pattern of pointer at 10.
The setting range is as follows:

[Setting range] 783 ~ 1023 / step 1

● OH alarm

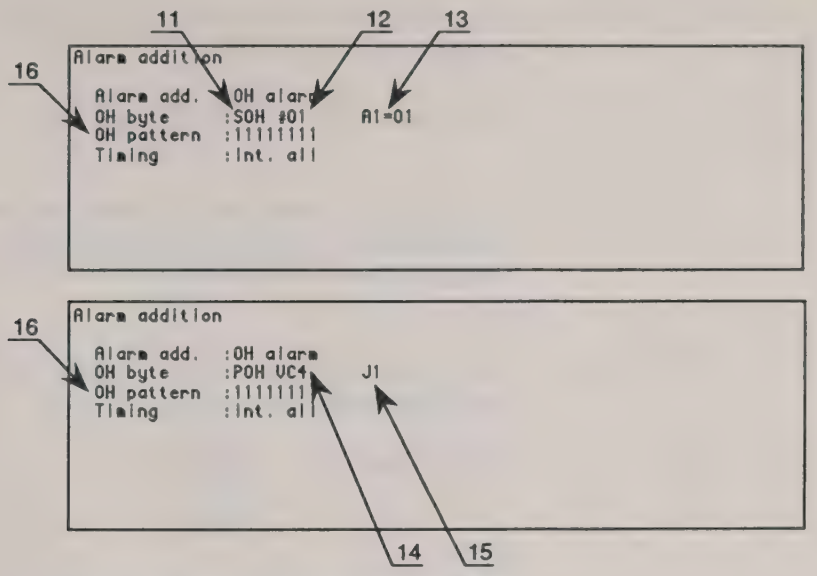


Fig. 5.12-28 OH alarm settings

Type — Sets the type of OH performed alarm addition at 11.
The setting range is as follows:

[Setting range] SOH
POH

SOH #No. — Sets the SOH No. performed alarm addition at 12.
The setting range is as follows:

[Setting range] #01 ~ #04 / step 1

Note:

1. SOH #No. 12 can be set when the Type 11 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04

SOH byte

Sets the SOH byte performed alarm addition at 13.
The setting range is as follows:

[Setting range] Arbitrary 1 byte except K1/K2, H1/H2/H3, B1 and B2

Note: SOH byte 13 can be set when the Type 11 is SOH.

POH type

Sets the type of POH performed alarm addition at 14.
The setting range is as follows:

[Setting range] VC4-4c
VC4
VC3

Note:
1. POH type 14 can be set when the Type 11 is POH.
2. Setting range has following restrictions according to the Unit of Route setting.

Unit	Setting range
VC3	VC3
VC4	VC4
VC4-4c	VC4-4c

POH byte

Sets the POH byte performed alarm addition at 15.
The setting range is as follows:

[Setting range] Arbitrary 1 byte except B3

Note: POH byte 15 can be set when the Type 11 is POH.

OH pattern

Sets the alarm pattern at 16.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

● K1/K2

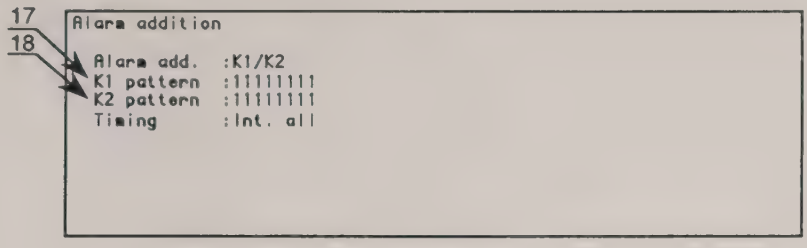


Fig. 5.12-29 K1/K2 settings

K1 pattern
K2 pattern

Sets the alarm pattern at 17 and 18.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

5. 12. 6 Bit error addition

The bit error addition items are set here.

[Setting items] There are following items because addition area.

OFF

All areas	:	Bit all
Information area	:	Bit info.
PRBS pattern inserted in OH	:	Bit OH PRBS

Bit error add

[Operation screen] The settings can be performed on the following screen.

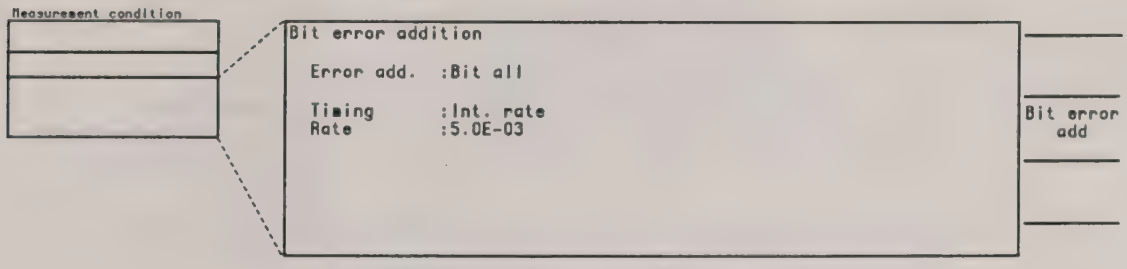


Fig. 5.12-29 Bit error addition screen

Note: The set error item is not enabled when the 'Bit error add' function key is disabled.

[Related items] The following item is affected.

Test pattern : OH pattern

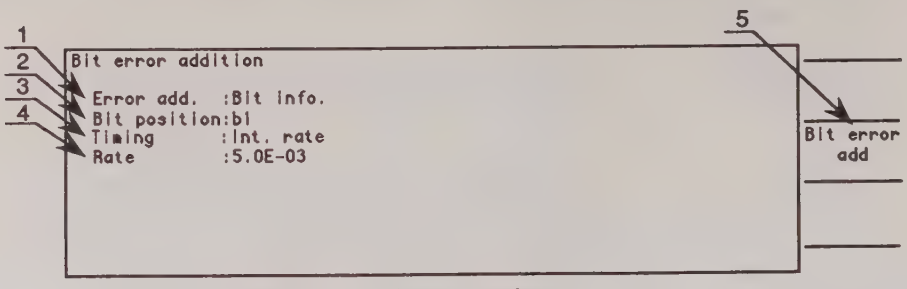


Fig. 5.12-30 Bit error settings

Error add. Sets the Bit error addition item at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
Bit all	: Adds error all areas of signal
Bit info.	: Adds arbitrary 1 bit error in Information area
Bit OH PRBS	: Adds error PRBS area inserted in OH

Note: Bit OH PRBS cannot be set when the OH type of test pattern is OFF or OH pattern is except PRBS.

Bit position Sets the Bit position added error at 2.
The setting range is as follows:

[Setting range] b1 ~ b8 / Arbitrary 1 bit

Note: Bit position 2 can be set when the Error add. 1 is Bit info..

Timing Sets the addition timing at 3.
The setting range is as follows:

[Setting range]

Int. single	: Adds 1 bit error when 'Bit error add' key 5 pressed
Int. rate	: Adds error according to error rate
Ext. single	: Adds 1 bit error at falling edge of input signal from Control Input Error connector

Rate

Sets the added error rate at 4.
The setting range is as follows:

[Setting range]
5.0E-03
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
1.0E-08
1.0E-09
1.0E-10

Note: Rate 4 can be set when the Timing 3 is Int. rate.

Bit error add

Controls the execution of Bit error addition by using 'Bit error add' function key at 5.
The setting range is as follows:

[Setting range]
Bit error add OFF : Does not add error
Bit error add ON : Adds error

Note:

1. The Bit error add 5 is disable when the Error add. 1 is OFF.
2. When the Bit error add is ON, the 'Bit error add' function key label is reverse-displayed and the error item being set is added in accordance with the Timing 3. In addition, the LED of error item being added (Bit or OH bit) light on the front panel error section.
3. When the Bit error add is OFF, the 'Bit error add' function key label is released from the reverse-display and the error is not added. In addition, the LED of Bit error item being added go off on the front panel error section.

5. 12. 7 Parity／FEBE error addition

The Parity／FEBE error addition items are set here.

[Setting items] The following items can be set.

OFF
Parity B1
B2
B3
FEBE Sect. FEBE : Section Far End Block Error
B3 FEBE

Parity/FEBE error add

[Operation screen] The settings can be performed on the following screen.

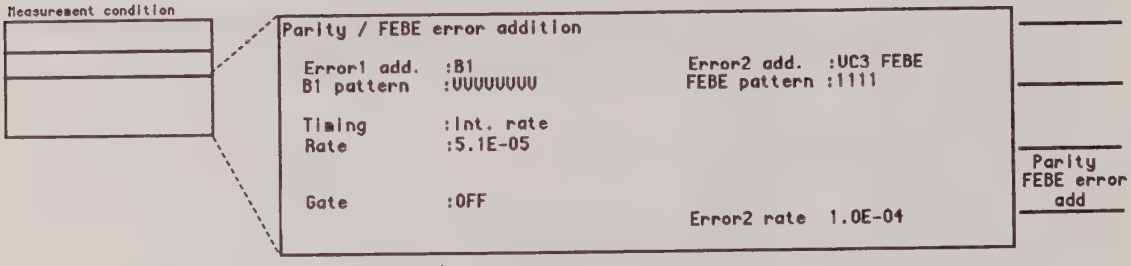


Fig. 5.12-31 Parity／FEBE error addition screen

Note:

1. Two types of error: Error1 and Error2 can be set simultaneously but the Error2 addition timing is performed at the Error1 set timing.
2. The set error items are not enabled when the 'Parity/FEBE error add' function key is disable.

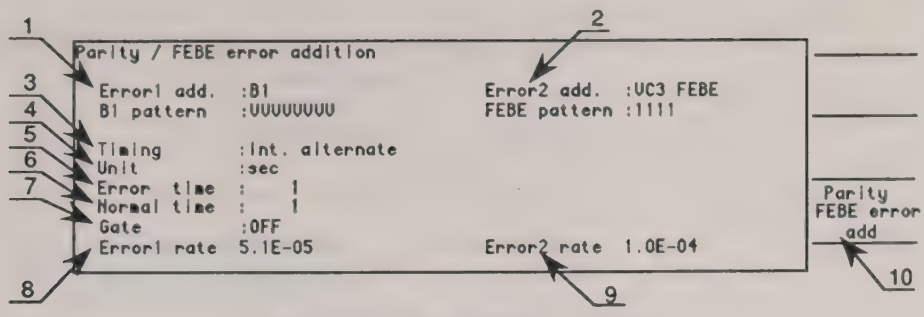


Fig. 5.12-32 Parity/FEBE error settings

Error1 add.
Error2 add.

Sets the error addition items at 1 and 2.
The setting range is as follows:

[Setting range]

OFF	: Does not add error
B1	: Adds error arbitrary bit in B1
B2	: Adds error arbitrary bit in B2
B3	: Adds error arbitrary bit in B3
Sect. FEBE	: Sets pattern to Z2 b2~b8
B3 FEBE	: Sets pattern to G1 b1~b4

Note:

1. The error addition cannot be performed when the Error1 add. 1 is OFF.
2. The same item cannot be set at the Error1 add. 1 and the Error2 add. 2 except at OFF.

Timing

Sets the addition timing at 3.
The setting range is as follows:

[Setting range]

- Int. single
- Int. all
- Int. rate
- Int. alternate
- Ext. single

Note: The addition timing of Error2 add. 2 is same as the Error1 add. 1.

■Control signal

Int. single	When Parity/FEBE error add 10 is OFF→ON, adds 1 frame
Int. all	Adds every frame
Int. rate	Adds used to set error rate
Int. alternate	
Ext. single	Adds 1 frame at falling edge of input signal from Control Input Error connector

Unit — Sets the Unit of addition time at 4.
The setting range is as follows:

[Setting range] Frame
μsec
msec
sec

Note: Unit 4 can be set when the Timing 3 is Int. alternate.

Error time — Sets the error addition time at 5.
The setting range is as follows:

[Setting range]
◆Frame
1 ～ 40000 ／ step 1
◆μsec
125 ～ 99875 ／ step 125
◆msec
1 ～ 8000 ／ step 1
◆sec
1 ～ 8 ／ step 1

Normal time — Sets the error no addition time at 6.
The setting range is as follows:

[Setting range] Same as Error time 5

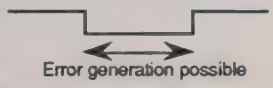
Note: Error time 5 and Normal time 6 can be set when the Timing 3 is Int. alternate.

Gate

Sets the error control according to external signal at 7.
The setting range is as follows:

[Setting range] OFF : Does not external control
External : Adds error while the input signal from Control Input Error connector is Low level

■Control signal
External



Note: Gate 7 can be set when the Timing 3 is Int. all, Int. rate or Int. alternate.

Error1 rate

Displays the added rate at 8.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:
1. Error1 rate 8 is displayed when the Error1 add. 1 is except VC1 FEBE and the Timing 3 is Int. alternate.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Error2 rate

Displays the added rate at 9.
The display range is as follows:

[Display range] 1.5E-12 ~ 2.0E-02

Note:
1. Error2 rate 9 is displayed when the Timing 3 is Int. alternate or Int. rate. But, it is not displayed when the Error2 add. 2 is VC1 FEBE.
2. Display range has restrictions according to the Bit rate of generated pattern and the setting pattern of each error items. (see table 5.4-1)

Parity/FEBE error add

Controls the execution of Parity/FEBE error addition by using the 'Parity/FEBE error add' function key at 10.
The setting range is as follows:

[Setting range] Parity/FEBE error add OFF : Does not add
Parity/FEBE error add ON : Adds error

Note:

1. The Parity/FEBE error add 10 is disable when the Error add. 1 is OFF.
2. When the Parity/FEBE error add is ON, The 'Parity/FEBE error add' function key label is reverse-displayed and the error items being set are added in accordance with the Timing 3. In addition, the LEDs of Parity/FEBE error items being added light on the front panel error section.
3. When the Parity/FEBE error add is OFF, the 'Parity/FEBE error add' function key label is released from the reverse-display and the errors are not added. In addition, the LEDs of Parity/FEBE error items being added go off on the front panel error section.

● B1

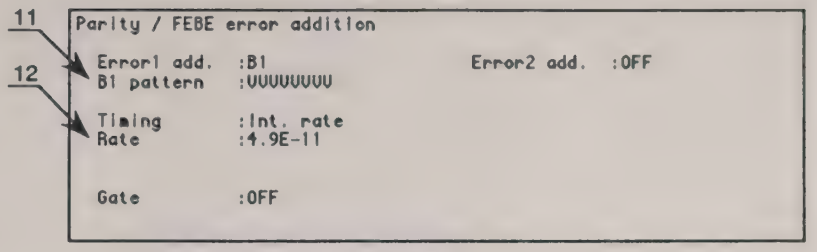


Fig. 5.12-33 B1 settings

B1 pattern — Sets the added pattern at 11.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ V V V V V V V V

＊ : Does not add
V : Adds pattern

Rate — Sets the added rate at 12.
The setting range is as follows:

[Setting range] 6.1E-12 ～ 6.2E-04

Note:

1. Rate 12 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B1 pattern 11. (see table 5.4-1)

● B2

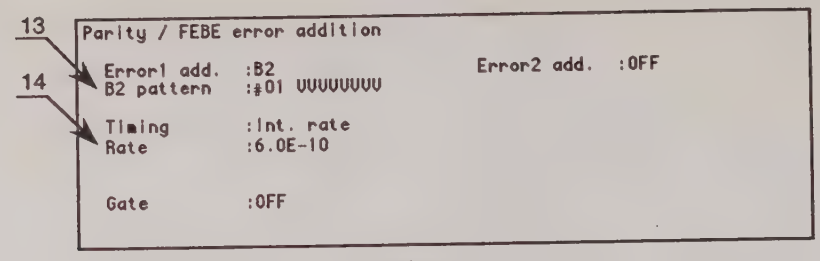


Fig. 5.12-34 B2 settings

B2 pattern — Sets the byte position and added pattern at 13.
The setting range is as follows:

[Setting range] ◆Byte position
#01 ～ #12 ／ step 1
◆Pattern
＊＊＊＊＊＊＊＊ ～ VVVVVVVV
＊ : Does not add
V : Adds pattern

Note: Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range	
	Byte position	Pattern
52 M	#01	Total 8 bit ＊／V
156 M	#01 ～ #03	Total 24 bit ＊／V
622 M	#01 ～ #12	Total 96 bit ＊／V

Rate — Sets the added rate at 14.
The setting range is as follows:

[Setting range] 6.2E-12 ～ 6.2E-04

Note:
1. Rate 14 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the B2 pattern 13. (see table 5.4-1)

● B3

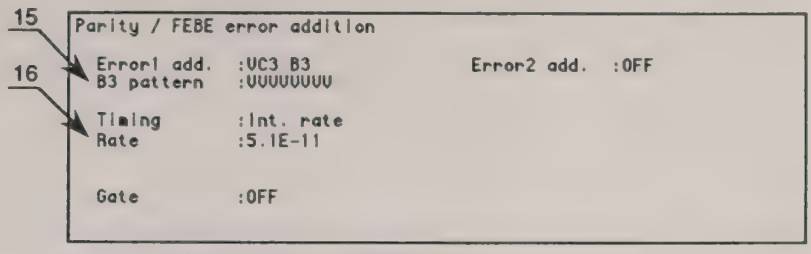


Fig. 5.12-35 B3 settings

B3 pattern Sets the added pattern at 15.
The setting range is as follows:

[Setting range] ＊＊＊＊＊＊＊＊ ～ V V V V V V V V
＊ : Does not add
V : Adds pattern

Rate Sets the added rate at 16.
The setting range is as follows:

[Setting range] 6.3E-12 ～ 6.5E-04

Note:

1. Rate 16 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the B3 pattern 15. (see table 5.4-1)

● Section FEBE

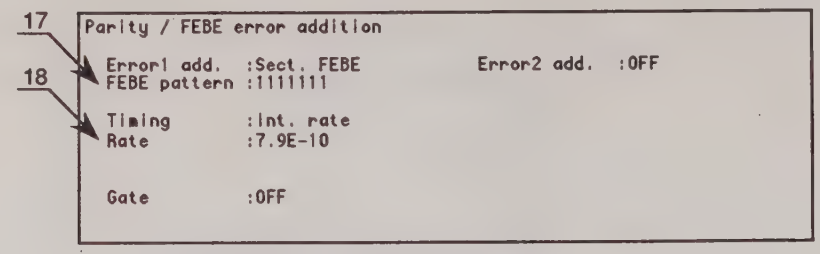


Fig. 5.12-36 Section FEBE settings

FEBE pattern Sets the added pattern at 17.
The setting range is as follows:

[Setting range] 0000000 ~ 1111111 / bit-pattern settings

Rate Sets the added rate at 18.
The setting range is as follows:

[Setting range] 6.2E-12 ~ 9.9E-03

Note:

1. Rate 18 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Bit rate of generated pattern and the FEBE pattern 17. (see table 5.4-1)

● B3 FEBE

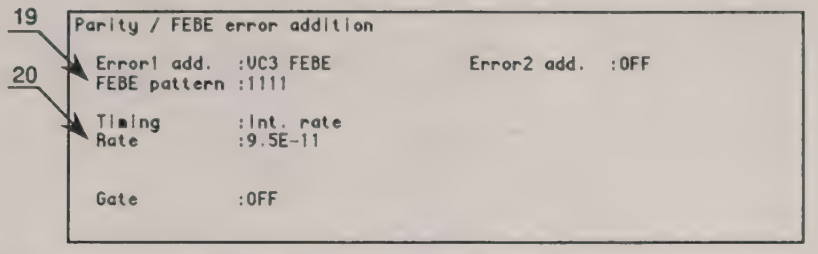


Fig. 5.12-37 B3 FEBE settings

FEBE pattern — Sets the added pattern at 19.
The setting range is as follows:

[Setting range] 0000 ~ 1111 / bit-pattern settings

Rate — Sets the added rate at 20.
The setting range is as follows:

[Setting range] 6.3E-12 ~ 1.2E-03

Note:

1. Rate 20 can be set when the Timing 3 is Int. rate.
2. Setting range has restrictions according to the Unit of Route setting and the FEBE pattern 19. (see table 5.4-1)

5. 12. 8 APS test

The APS test is set here.

[Setting items] The following items can be set.

Normal pattern	K1 pattern
	K2 pattern
Test pattern	K1 pattern
	K2 pattern

[Operation screen] The settings can be performed on the following screen.

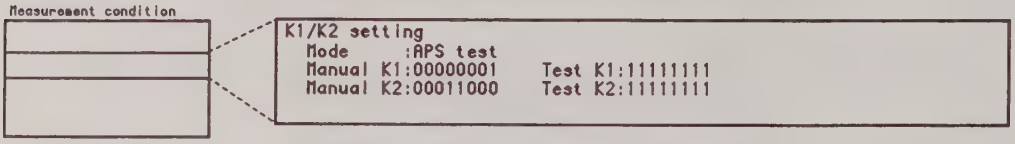


Fig. 5.12-38 APS test setting screen

Note: Alarm addition cannot be performed at the APS test execution condition.

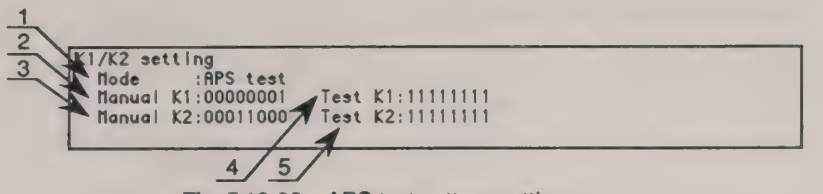


Fig. 5.12-39 APS test pattern settings

Mode Sets the K1/K2 setting mode at 1.
The setting range is as follows:

[Setting range] APS test : Automatic Protection Switching

Manual K1
Manual K2 Sets the Normal pattern of K1/K2 at 2 and 3.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

Test K1
Test K2 Sets the Test pattern of K1/K2 at 4 and 5.
The setting range is as follows:

[Setting range] 00000000 ~ 11111111 / bit-pattern settings

Change timing Manual pattern and Test pattern are changed by input signal from Control Input Alarm/Trigger connector.

I : Outputs Manual pattern
II : Outputs Test pattern

5. 12. 9 Trigger output

The output trigger source is set here.

[Setting items] The following item can be set.

Trigger source	OFF
	Alarm／APS test
	Bit error
	Parity／FEBE error
	AU PTR change
	AU PTR +PJC
	AU PTR - PJC
	Frame pulse
	K1／K2 manual
	SOH／POH

[Operation screen] The settings can be performed on the following screen.

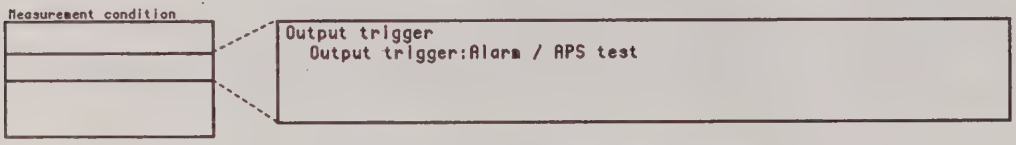


Fig. 5.12-40 Trigger output setting screen

[Related items] The following items are affected.

Route setting	:	Unit, Format
K1/K2 pattern	:	Manual setting

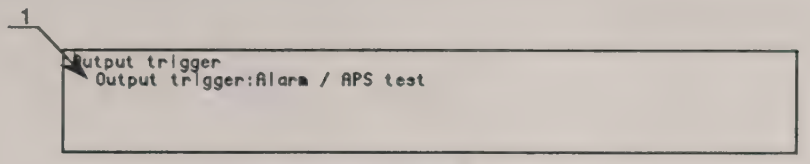


Fig. 5.12-41 Output trigger settings

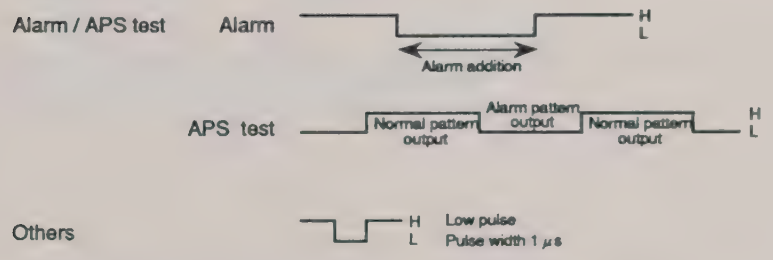
Output trigger

Sets the output trigger source at 1.
The setting range is as follows:

[Setting range]

OFF	: Does not output trigger
Alarm / APS test	: Outputs at alarm addition time or APS test set time
Bit error	: Outputs at Bit error addition time
Parity / FEBE error	: Outputs at Parity/FEBE error addition time
AU PTR change	: Outputs at PTR change time except PJC
AU PTR +PJC	: Outputs at +PJC time
AU PTR −PJC	: Outputs at -PJC time
Frame pulse	: Outputs at SOH 1 row generation time
K1 / K2 manual	: Outputs at K1/K2 manual changing time
SOH / POH	: Outputs at SOH/POH specified 1 byte

■Trigger signal



Note:

1. AU PTR change, +PJC and -PJC cannot be set when the Pointer setting is Pointer seq. test (type: AU PTR).
2. K1/K2 manual can be set when the K1/K2 setting is Manual.

● SOH／POH

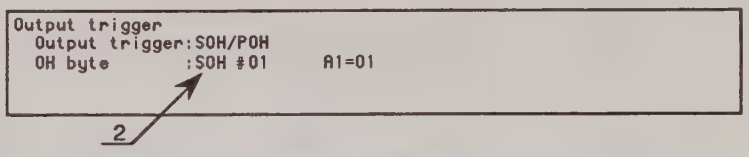


Fig. 5.12-42 SOH/POH settings

Type Sets the type of trigger output OH at 2.
The setting range is as follows:

[Setting range] SOH
POH

Note: Type 2 can be set when the Output trigger 1 is SOH/POH.

◆ SOH

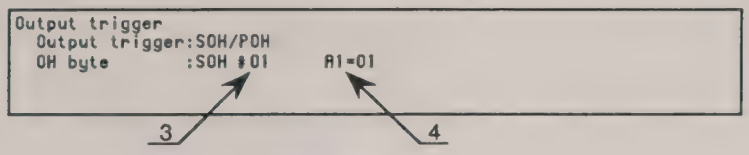


Fig. 5.12-43 SOH settings

SOH #No. Sets the trigger output SOH No. at 3.
The setting range is as follows:

[Setting range] #01 ~ #04 / step 1

Note:

1. SOH #No. 3 can be set when the Type 2 is SOH.
2. Setting range has following restrictions according to the Bit rate of generated pattern.

Bit rate	Setting range
52 M	#01
156 M	#01
622 M	#01 ~ #04

SOH byte Sets the byte of trigger output SOH at 4.
The setting range is as follows:

[Setting range] Arbitrary 1 byte

Note: SOH byte 4 can be set when the Type 2 is SOH.

◆ POH

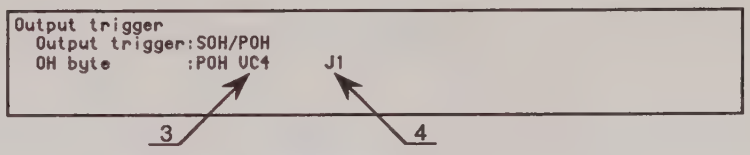


Fig. 5.12-44 POH settings

POH type Sets the type of trigger output POH at 3.
The setting range is as follows:

[Setting range] VC4-4c
VC4
VC3

Note:
1. POH type 3 can be set when Type 2 is POH.
2. Setting range has following restrictions according to the Route setting.

Unit	Setting range
VC3	VC3
VC4	VC4
VC4-4c	VC4-4c

POH byte Sets the byte of trigger output POH at 4.
The setting range is as follows:

[Setting range] Arbitrary 1 byte

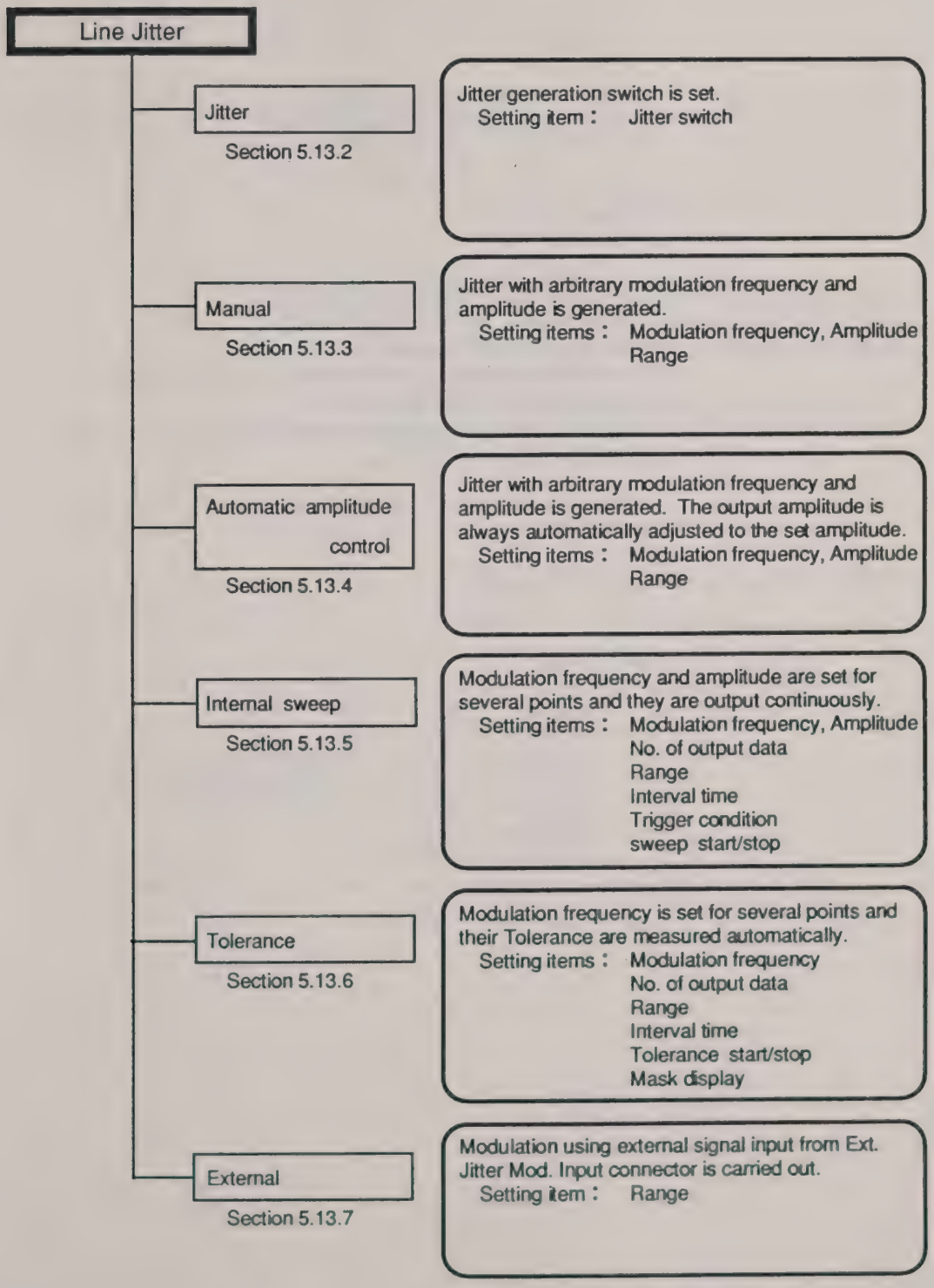
Note: POH byte 4 can be set when the Type 2 is POH.

5. 13 Setting Line Jitter

5. 13. 1 List of functions

This function generates line jitter.

Line Jitter functions are listed below.



5. 13. 2 Jitter

The Jitter generation switch is set here.

[Setting items] The following item can be set.

- Jitter

[Operation screen] The settings can be performed on the following screen.

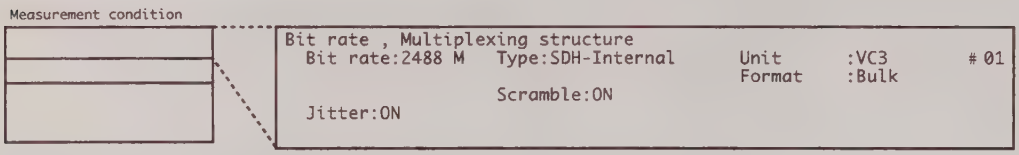
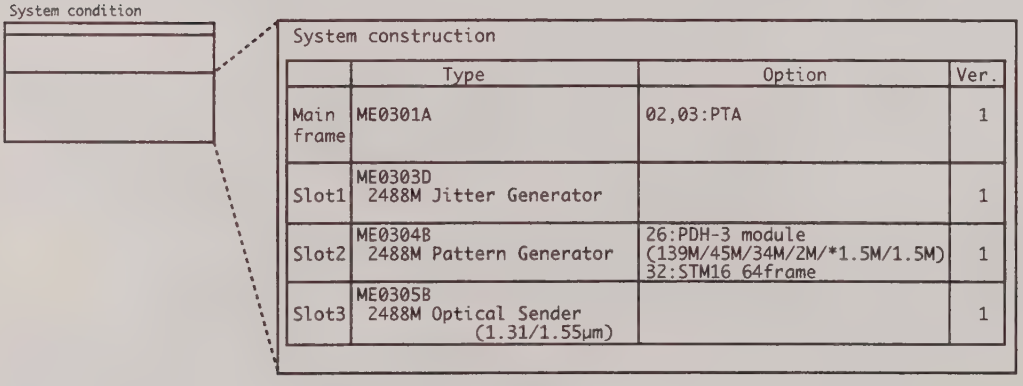


Fig. 5.13-1 Jitter setting screen

[Related items] The following items are affected.

- When the ME0303C/D plug-in unit is installed in slot 1, settings can be made for the case shown below.
  The Bit rate of generated pattern is 52M, 156M, 622M or 2488M.
  Type is other than SDH-Insert.

In addition, the plug-in unit installation status can be conformed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0303D 2488M Jitter Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.13-2 Related screen

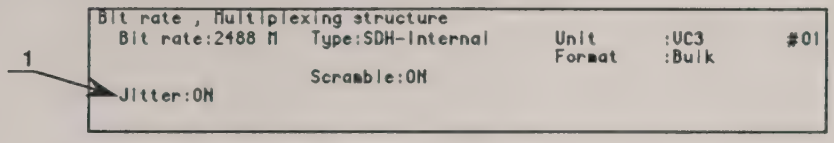


Fig. 5.13-3 Jitter settings

Jitter Sets the jitter generation switch at 1.
The setting range is as follows:

[Setting range] OFF : Jitter generation impossible
ON : Jitter generation possible

Note:

1. When the Jitter is OFF, jitter related settings cannot be made at the Measurement condition screen. However, it is available at the Jitter sweep table screen and Jitter tolerance table screen.
2. Ensure that Jitter is OFF when jitter generation is not performed.

5. 13. 3 Manual

The jitter of arbitrary modulation frequency and amplitude is generated here.

[Setting items] The following items can be set.

- Mode
- Modulation frequency
- Amplitude
- Range

[Operation screen] The settings can be performed on the following screen.

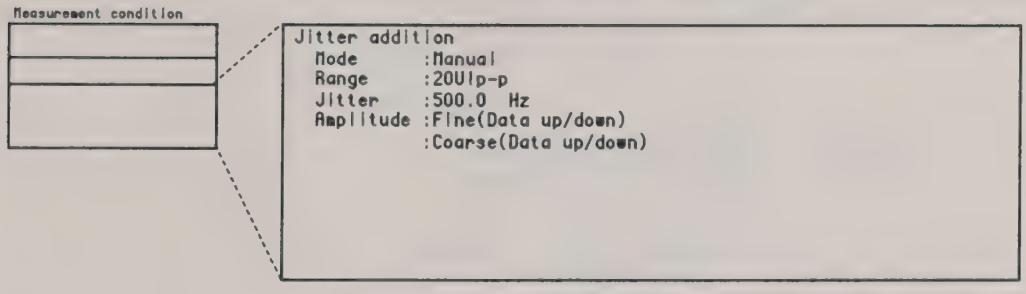


Fig. 5.13-4 Manual setting screen

[Related Items] The following item is affected.

・The settings can be performed when the Jitter switch is ON.

In addition, the amount of jitter output can be monitored at the following screen.

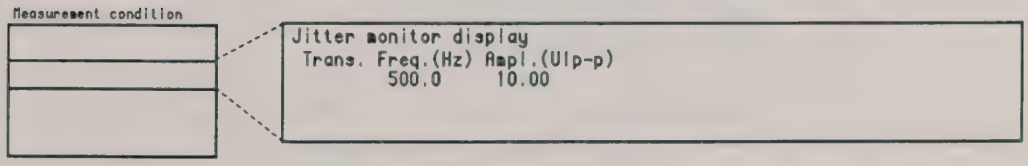


Fig. 5.13-5 Monitor screen

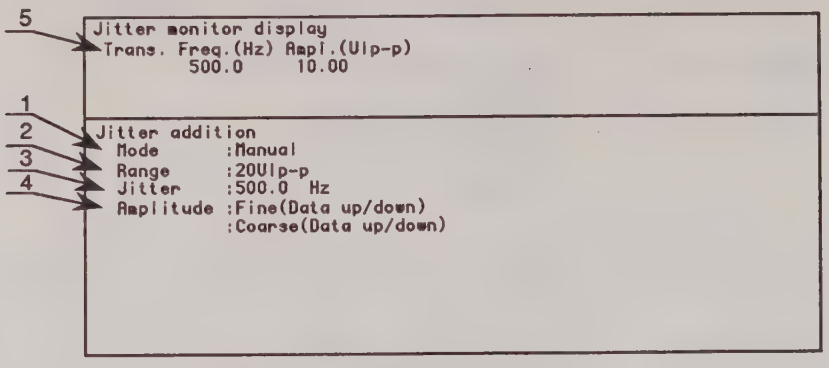


Fig. 5.13-6 Manual settings

Mode Sets the jitter generation mode at 1.
The setting range is as follows:

[Setting range] Manual

Range Sets the jitter generation range at 2.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Jitter Sets the modulation frequency at 3.
The setting range is as follows:

[Setting range] 10 Hz ~ 20 MHz

Frequency			Resolution
10	~	99	1
100	~	990	10
1k	~	9.9k	100
10k	~	99k	1k
100k	~	990k	10k
1M	~	9.9M	100k
10M	~	20M	1M

Note:

1. The setting range is restricted by the Bit rate of generated pattern.
(see next page <Restrictions>)
2. When it is not possible to reset the amplitude set for the current modulation frequency setting, the value of the amplitude output will be set to the maximum possible.
3. The values set here are displayed at Freq.(Hz) 5 on the jitter monitor display screen.

Amplitude

Sets the amplitude at 4.
The setting method and setting range are as follows:

[Setting method]
Fine : Sets to minimum resolution
Coarse : Sets to ×20 resolution

Move the cursor to Fine (Data up/down), Coarse (Data up/down) and make the setting by turning the rotary encoder or pressing step keys.
However, the setting value can be checked at Ampl.(Ulp-p) 5 on the Jitter monitor display screen.

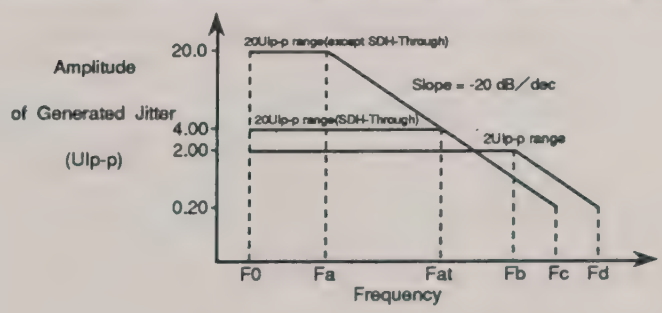
[Setting range] 0 ~ 20 Ulp-p

Generated pattern Type	Range	Amplitude	Resolution
–	2 Ulp-p	0.000 ~ 2.000	0.001
Except SDH-Through	20 Ulp-p	0.00 ~ 20.00	0.01
SDH-Through		0.00 ~ 4.00	0.01

– : Don't care

<Restrictions>

The frequency and amplitude setting ranges are restricted by as follows:



Bit rate	F0[Hz]	Fa[Hz]	Fat[Hz]	Fb[Hz]	Fc[Hz]	Fd[Hz]
52 M	10	2k	10k	50k	200k	500k
156 M	10	5k	25k	150k	500k	1.5M
622 M	10	20k	100k	600k	2M	6M
2488 M	10	20k	100k	2M	2M	20M

Trans. Freq.(Hz)
Ampl.(Ulp-p)

Monitors the amount of jitter produced at 5.

Note: For further details refer to ■ Jitter Generation.

■ Jitter Generation

Trans. Freq. (Hz) Displays the modulation frequency at 5.
The display format is as follows:

[Display format]

Modulation frequency			Display format
10	~	990	###. #
1k	~	990k	###. #k
1M	~	20M	###. #M

Ampl.(Ulp-p) Displays the amplitude output at 5.
The display format is as follows:

[Display format]

Generated pattern Type	Range	Normal display	Abnormal display (Overflow)
–	2 Ulp-p	##. ###	>2.020
Except SDH-Through	20 Ulp-p	###. ##	>20.20
SDH-Through		###. ##	>4.00

– : Don't care

5. 13. 4 Automatic amplitude control

The jitter of arbitrary modulation frequency and amplitude is generated here.
Further, the amplitude of the output is always automatically adjusted to that of the amplitude setting.

[Setting items] The following items can be set.

- Mode
- Modulation frequency
- Amplitude
- Range

[Operation screen] The setting can be performed on the following screen.

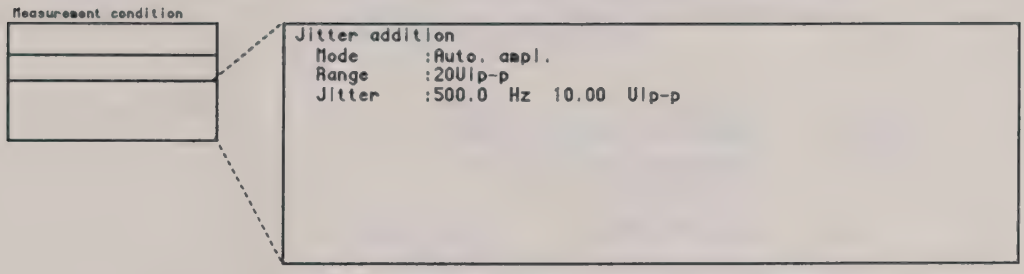


Fig. 5.13-7 Automatic amplitude control setting screen

[Related items] The following item is affected.

・The setting can be performed when Jitter switch is ON.

In addition, the amount of jitter output can be monitored at the following screen.

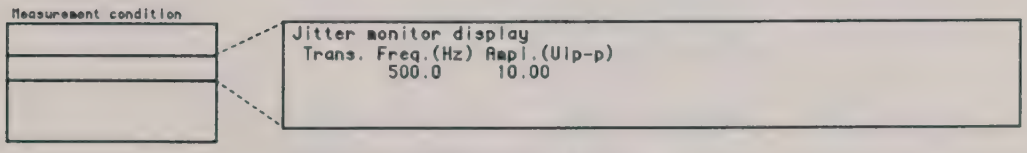


Fig. 5.13-8 Monitor screen

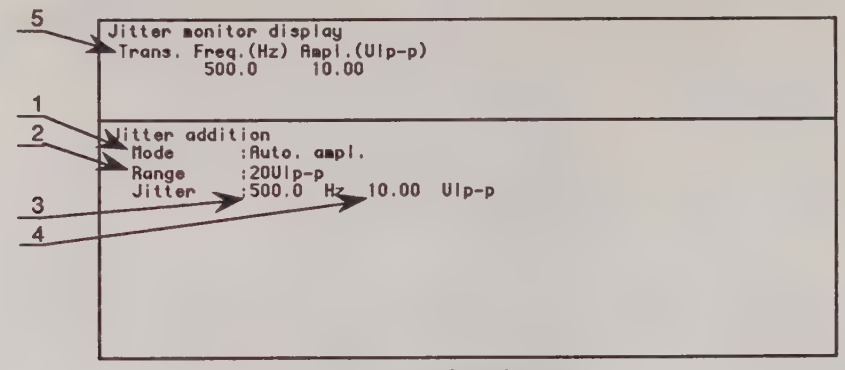


Fig. 5.13-9 Auto. ampl. settings

Mode — Sets the jitter generation mode at 1.
The setting range is as follows:

[Setting range] Auto. ampl.

Range — Sets the jitter generation range at 2.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Jitter(Freq.) — Sets the modulation frequency at 3.
The setting range is as follows:

[Setting range] 10 Hz ~ 20 MHz

Frequency			Resolution
10	~	99	1
100	~	990	10
1k	~	9.9k	100
10k	~	99k	1k
100k	~	990k	10k
1M	~	9.9M	100k
10M	~	20M	1M

Note:

1. The setting range is restricted by the Bit rate of generated pattern.
(see next page <Restrictions>)
2. When it is not possible to reset the amplitude set for the current modulation frequency setting, the value of the amplitude output will be set to the maximum possible.
3. The values set here are displayed at Freq.(Hz) 5 on the jitter monitor display screen.

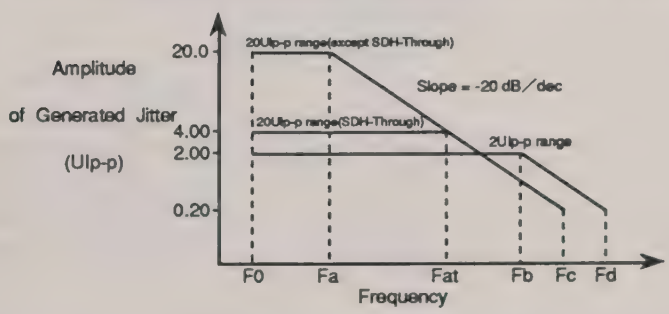
Jitter(Ampl.) Sets the amplitude at 4.
The setting range is as follows:

[Setting range] 0 ~ 20 UIp-p

Generated pattern Type	Range	Amplitude	Resolution
–	2 UIp-p	0.000 ~ 2.000	0.001
Except SDH-Through	20 UIp-p	0.00 ~ 20.00	0.01
SDH-Through		0.00 ~ 4.00	0.01

– : Don't care

<Restrictions> The frequency and amplitude setting ranges are restricted by as follows:



Bit rate	F0[Hz]	Fa[Hz]	Fat[Hz]	Fb[Hz]	Fc[Hz]	Fd[Hz]
52 M	10	2k	10k	50k	200k	500k
156 M	10	5k	25k	150k	500k	1.5M
622 M	10	20k	100k	600k	2M	6M
2488 M	10	20k	100k	2M	2M	20M

■ Jitter Generation

Trans. Freq. (Hz) Displays the modulation frequency at 5.
The display format is as follows:

[Display format]

Modulation frequency			Display format
10	~	990	###. #
1k	~	990k	###. #k
1M	~	20M	###. #M

Ampl.(Ulp-p) Displays the amplitude output at 5.
The display format is as follows:

[Display format]

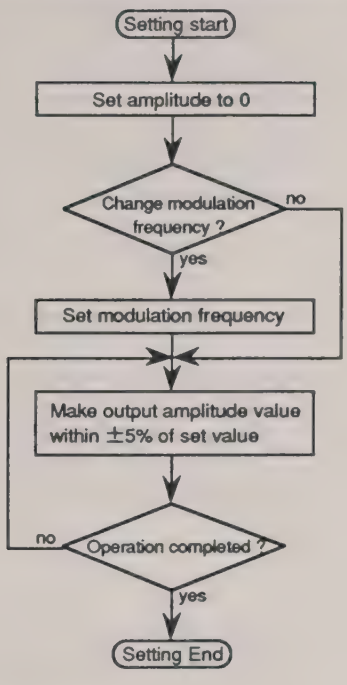
Generated pattern Type	Range	Normal display	Abnormal display (Overflow)
—	2 Ulp-p	##. ###	>2.020
Except SDH-Through	20 Ulp-p	###. ##	>20.20
SDH-Through		###. ##	>4.00

— : Don't care

Note: The value of the output amplitude and Jitter(Ampl.) 4 are not necessary the same.

Amplitude setting procedure

When the modulation frequency and the amplitude value are changed, the amplitude of the output jitter is set according to the following procedure:



Note: Because operation is carried out gradually every 200ms, it takes about 2 seconds to set the object amplitude value.
In addition, if the output value is outside ±5% of the setting after the object amplitude has been set, the frequency of operation is automatically adjusted to every 200ms.

5. 13. 5 Internal sweep

The modulation frequency and amplitude for several points are set and generate continuous jitter here.

[Setting items] The following items can be set.

- Modulation frequency
- Amplitude
- No. of output data
- Range
- Interval time
- Trigger conditions
- Sweep start/stop

[Operation screen] The settings can be performed on the following screen.

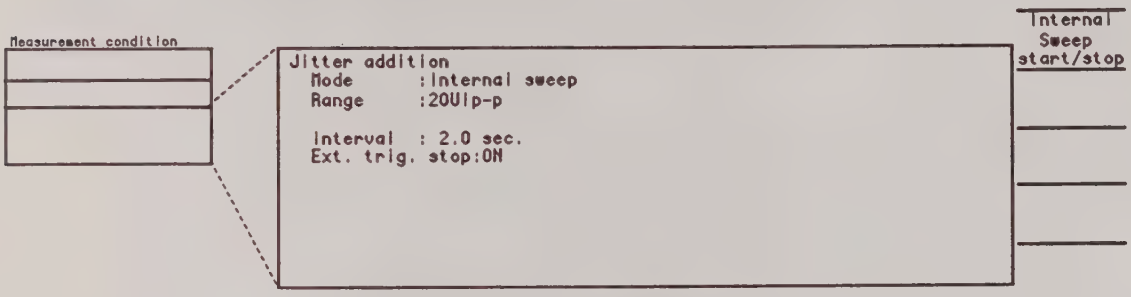


Fig. 5.13-10 Internal sweep setting screen 1

Jitter sweep table

Bit rate:2488 M Default-set Print-out
Range :20UIp-p
Number of table:20

No	Hz	UIp-p	No	Hz	UIp-p	No	Hz	UIp-p	No	Hz	UIp-p
1	10.0	15.00	19	3.3 M	0.15	37	5.0 M	0.15	55	5.0 M	0.15
2	23.0	15.00	20	5.0 M	0.15	38	5.0 M	0.15	56	5.0 M	0.15
3	51.0	15.00	21	5.0 M	0.15	39	5.0 M	0.15	57	5.0 M	0.15
4	120.0	15.00	22	5.0 M	0.15	40	5.0 M	0.15	58	5.0 M	0.15
5	270.0	15.00	23	5.0 M	0.15	41	5.0 M	0.15	59	5.0 M	0.15
6	600.0	15.00	24	5.0 M	0.15	42	5.0 M	0.15	60	5.0 M	0.15
7	1.3 k	6.92	25	5.0 M	0.15	43	5.0 M	0.15	61	5.0 M	0.15
8	2.8 k	3.21	26	5.0 M	0.15	44	5.0 M	0.15	62	5.0 M	0.15
9	6.0 k	1.50	27	5.0 M	0.15	45	5.0 M	0.15	63	5.0 M	0.15
10	12.0 k	1.50	28	5.0 M	0.15	46	5.0 M	0.15	64	5.0 M	0.15
11	24.0 k	1.50	29	5.0 M	0.15	47	5.0 M	0.15	65	5.0 M	0.15
12	49.0 k	1.50	30	5.0 M	0.15	48	5.0 M	0.15	66	5.0 M	0.15
13	100.0 k	1.50	31	5.0 M	0.15	49	5.0 M	0.15	67	5.0 M	0.15
14	220.0 k	0.68	32	5.0 M	0.15	50	5.0 M	0.15	68	5.0 M	0.15
15	460.0 k	0.33	33	5.0 M	0.15	51	5.0 M	0.15	69	5.0 M	0.15
16	1.0 M	0.15	34	5.0 M	0.15	52	5.0 M	0.15	70	5.0 M	0.15
17	1.5 M	0.15	35	5.0 M	0.15	53	5.0 M	0.15	71	5.0 M	0.15
18	2.2 M	0.15	36	5.0 M	0.15	54	5.0 M	0.15	72	5.0 M	0.15

Fig. 5.13-11 Internal sweep setting screen 2

[Related items]

The following item is affected.

・The setting can be performed when Jitter switch is ON.

In addition, the amount of output jitter, output location, etc. can be monitored at following screen.

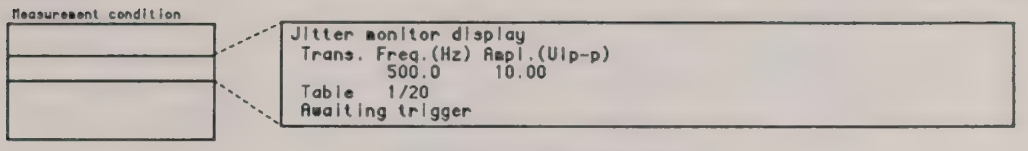


Fig. 5.13-12 Monitor screen

●Measurement condition screen

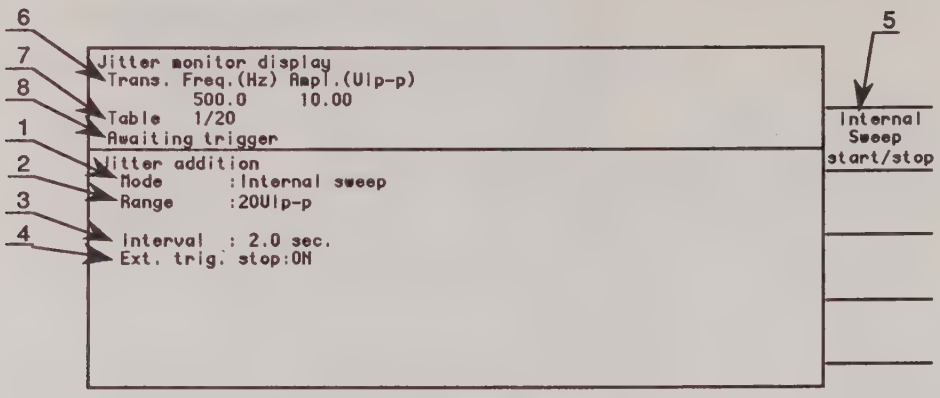


Fig. 5.13-13 Int. sweep settings

Mode — Sets the jitter generation mode at 1.
The setting range is as follows:

[Setting range] Internal sweep

Range — Sets the jitter generation range at 2.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Note: When generated pattern is SDH-Through, 20 Ulp-p cannot be set.

Interval — Sets the interval up to the start of the next point at 3.
The setting range is as follows:

[Setting range] 0.1 ～ 10.0 sec ／ step 0.1

Note: The interval time is the time from when 80% of the target amplitude values have been set to the start of setting the next point. A minimum of 2 seconds is required to add the jitter for a set value.

Ext. trig. stop

Sets the sweep stop condition at 4.
The setting range is as follows:

[Setting range] OFF : Not affected by external trigger signal
ON : External trigger signal stops sweeping

Internal sweep start/stop

Sets the sweep start/stop at 5. Pressing the soft-key toggles the status alternately between start and stop.
The setting range is as follows:

[Setting range] Start : Reverse displayed; sweeping starts
Stop : Normal display; sweeping stops

Note:

1. Returns automatically to Stop status when sweeping ends or sweeping is stopped by external trigger signal when Ext. trig. stop is ON.
2. When the following conditions are changed, the Start status changes to the Stop status.
   - Bit rate of generated pattern
   - Mapping
   - Range 2 , Interval 3 , Ext. trig. stop 4
   - Number of table 11 on Jitter sweep table screen
   - Table data during output

Trans. Freq.(Hz) Ampl.(UIp-p)

Monitors the amount of output jitter at 6.

Note:

Refer to ■ Jitter generation for further details.

Table

Among all data, monitors the location currently being output at 7.

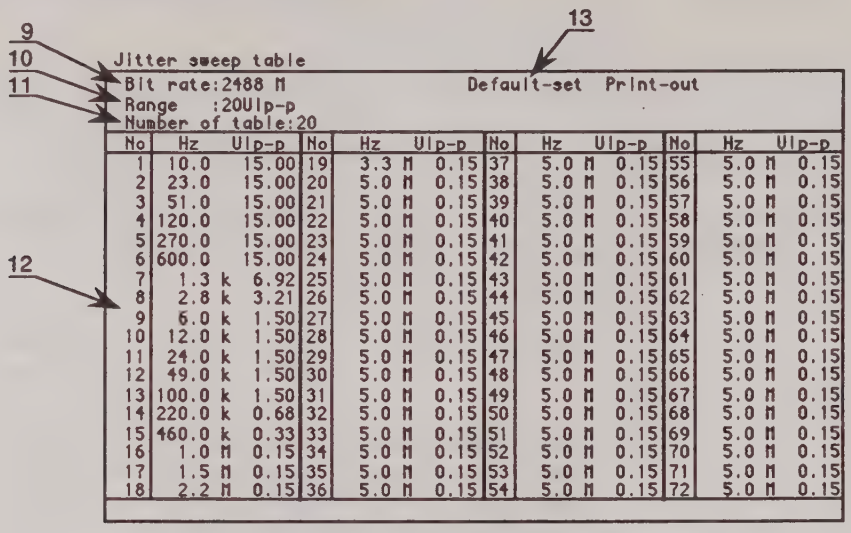
(Trigger status)

Monitors the external trigger input at 8.
Waiting for trigger : Awaiting trigger
Trigger received : Triggered at table No. ##

Note:

The trigger status can be monitored only when Ext. trig. stop 4 is ON.

●Jitter sweep table screen



No	Hz	Ulp-p	No	Hz	Ulp-p	No	Hz	Ulp-p	No	Hz	Ulp-p
1	10.0	15.00	19	3.3 M	0.15	37	5.0 M	0.15	55	5.0 M	0.15
2	23.0	15.00	20	5.0 M	0.15	38	5.0 M	0.15	56	5.0 M	0.15
3	51.0	15.00	21	5.0 M	0.15	39	5.0 M	0.15	57	5.0 M	0.15
4	120.0	15.00	22	5.0 M	0.15	40	5.0 M	0.15	58	5.0 M	0.15
5	270.0	15.00	23	5.0 M	0.15	41	5.0 M	0.15	59	5.0 M	0.15
6	600.0	15.00	24	5.0 M	0.15	42	5.0 M	0.15	60	5.0 M	0.15
7	1.3 k	6.92	25	5.0 M	0.15	43	5.0 M	0.15	61	5.0 M	0.15
8	2.8 k	3.21	26	5.0 M	0.15	44	5.0 M	0.15	62	5.0 M	0.15
9	6.0 k	1.50	27	5.0 M	0.15	45	5.0 M	0.15	63	5.0 M	0.15
10	12.0 k	1.50	28	5.0 M	0.15	46	5.0 M	0.15	64	5.0 M	0.15
11	24.0 k	1.50	29	5.0 M	0.15	47	5.0 M	0.15	65	5.0 M	0.15
12	49.0 k	1.50	30	5.0 M	0.15	48	5.0 M	0.15	66	5.0 M	0.15
13	100.0 k	1.50	31	5.0 M	0.15	49	5.0 M	0.15	67	5.0 M	0.15
14	220.0 k	0.68	32	5.0 M	0.15	50	5.0 M	0.15	68	5.0 M	0.15
15	460.0 k	0.33	33	5.0 M	0.15	51	5.0 M	0.15	69	5.0 M	0.15
16	1.0 M	0.15	34	5.0 M	0.15	52	5.0 M	0.15	70	5.0 M	0.15
17	1.5 M	0.15	35	5.0 M	0.15	53	5.0 M	0.15	71	5.0 M	0.15
18	2.2 M	0.15	36	5.0 M	0.15	54	5.0 M	0.15	72	5.0 M	0.15

Fig. 5.13-14 Jitter sweep table settings

Bit rate Sets the Bit rate of the data to be edited at 9.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Range Sets the range of the data to be edited at 10.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Note: The Bit rate 9 and the Range 10 can be set irrespective of the measurement condition screen. However, for the output data, the Bit rate and Range are determined by the measurement condition screen.

Number of table Sets the No. of output data at 11.
The setting range is as follows:

[Setting range] 1 ~ 72 points / step 1

Hz Sets the modulation frequency at 12.
The setting range is as follows:

[Setting range] 10 Hz ~ 20 MHz

Frequency	Resolution
10 ~ 99	1
100 ~ 990	10
1k ~ 9.9k	100
10k ~ 99k	1k
100k ~ 990k	10k
1M ~ 9.9M	100k
10M ~ 20M	1M

Note: Settings cannot be set lower than frequency of previous table No..

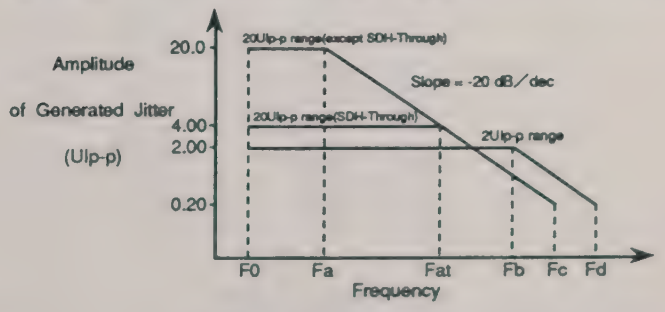
Ulp-p Sets the amplitude at 12.
The setting range is as follows:

[Setting range] 0 ~ 20 Ulp-p

Generated pattern Type	Range	Amplitude	Resolution
–	2 Ulp-p	0.000 ~ 2.000	0.001
Except SDH-Through	20 Ulp-p	0.00 ~ 20.00	0.01
SDH-Through		0.00 ~ 4.00	0.01

– : Don't care

<Restrictions> · The frequency and amplitude setting range are restricted as follows:



Bit rate	F0[Hz]	Fa[Hz]	Fat[Hz]	Fb[Hz]	Fc[Hz]	Fd[Hz]
52 M	10	2k	10k	50k	200k	500k
156 M	10	5k	25k	150k	500k	1.5M
622 M	10	20k	100k	600k	2M	6M
2488 M	10	20k	100k	2M	2M	20M

Default-set

Sets the default values at 13 for the currently-set Bit rate 9 and Range 10. The setting value is as follows:

[Setting value] Range : 2UIp-p

No.	52 M		156 M		622 M		2488 M	
	Hz	UIp-p	Hz	UIp-p	Hz	UIp-p	Hz	UIp-p
1	300	1.500	300	1.500	300	1.500	6,000	1.500
2	430	1.500	470	1.500	520	1.500	9,000	1.500
3	640	1.500	720	1.500	900	1.500	14,000	1.500
4	920	1.500	1,100	1.500	1,600	1.500	21,000	1.500
5	1,400	1.500	1,700	1.500	2,800	1.500	31,000	1.500
6	2,000	1.500	2,600	1.500	4,800	1.500	46,000	1.500
7	3,000	1.000	4,100	1.500	8,400	1.500	68,000	1.500
8	4,500	0.667	6,500	1.500	15,000	1.500	100,000	1.500
9	6,500	0.462	9,600	1.016	25,000	1.500	160,000	0.938
10	9,200	0.326	14,000	0.696	40,000	0.938	250,000	0.600
11	14,000	0.214	21,000	0.464	64,000	0.586	390,000	0.385
12	20,000	0.150	32,000	0.305	100,000	0.375	620,000	0.242
13	30,000	0.150	46,000	0.212	160,000	0.234	1,000,000	0.150
14	43,000	0.150	65,000	0.150	250,000	0.150	1,600,000	0.150
15	64,000	0.150	110,000	0.150	410,000	0.150	2,500,000	0.150
16	93,000	0.150	190,000	0.150	680,000	0.150	3,700,000	0.150
17	140,000	0.150	310,000	0.150	1,100,000	0.150	5,800,000	0.150
18	200,000	0.150	500,000	0.150	1,800,000	0.150	9,000,000	0.150
19	300,000	0.150	800,000	0.150	3,000,000	0.150	14,000,000	0.150
20	500,000	0.150	1,500,000	0.150	6,000,000	0.150	20,000,000	0.150

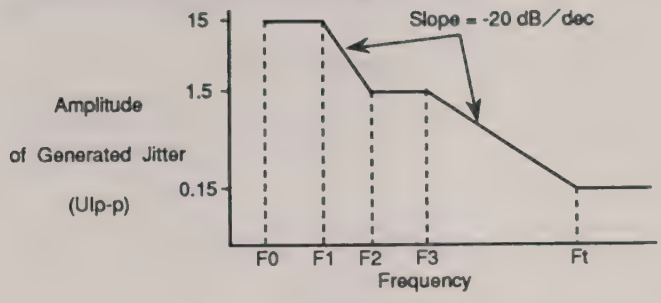
Range : 20UIp-p

No.	52 M		156 M		622 M		2488 M	
	Hz	UIp-p	Hz	UIp-p	Hz	UIp-p	Hz	UIp-p
1	10	15.00	10	15.00	10	15.00	10	15.00
2	17	15.00	17	15.00	17	15.00	23	15.00
3	30	15.00	30	15.00	30	15.00	51	15.00
4	53	8.49	53	8.49	65	6.92	120	15.00
5	95	4.74	95	4.74	140	3.21	270	15.00
6	170	2.65	170	2.65	300	1.50	800	15.00
7	300	1.50	300	1.50	630	1.50	1,300	6.92
8	570	1.50	650	1.50	1,300	1.50	2,800	3.21
9	1,100	1.50	1,400	1.50	2,700	1.50	6,000	1.50
10	2,000	1.50	3,000	1.50	5,700	1.50	12,000	1.50
11	3,600	0.83	6,500	1.50	12,000	1.50	24,000	1.50
12	6,300	0.48	12,000	0.81	25,000	1.50	49,000	1.50
13	11,000	0.27	21,000	0.46	54,000	0.69	100,000	1.50
14	20,000	0.15	37,000	0.26	120,000	0.31	220,000	0.68
15	33,000	0.15	65,000	0.15	250,000	0.15	460,000	0.33
16	56,000	0.15	120,000	0.15	460,000	0.15	1,000,000	0.15
17	93,000	0.15	220,000	0.15	830,000	0.15	2,000,000	0.15
18	160,000	0.15	390,000	0.15	1,500,000	0.15	2,000,000	0.15
19	200,000	0.15	500,000	0.15	2,000,000	0.15	2,000,000	0.15
20	200,000	0.15	500,000	0.15	2,000,000	0.15	2,000,000	0.15

Note:

1. The other Bit rate data is not affected.
2. The No. of data is fixed at 20 points (Number of table : 20) .
   No. 21 and beyond take on the same value as No. 20.

In addition, the modulation frequency and amplitude for Default-set are determined according to the following conditions.



Bit rate	F0[Hz]	F1[Hz]	F2[Hz]	F3[kHz]	Ft[kHz]
52 M	10	30	300	2	20
156 M	10	30	300	6.5	65
622 M	10	30	300	25	250
2488 M	10	600	6000	100	1000

■ Jitter generation

Freq.(Hz) Displays the modulation frequency at 6.
The display format is as follows:

[Display format]

Modulation frequency			Display format
10	~	990	###. #
1k	~	990k	###. #k
1M	~	20M	###. #M

Ampl.(Ulp-p) Displays the output amplitude at 6.
The display format is as follows:

[Display format]

Generated pattern Type	Range	Normal display	Abnormal display (Overflow)
–	2 Ulp-p	##. ###	>2.020
Except SDH-Through	20 Ulp-p	###. ##	>20.20
SDH-Through		###. ##	>4.00

– : Don't care

Note: The values of the output amplitude and the Ulp-p 12 are not necessarily the same.

Sweep start/Stop When sweeping is started with the Internal sweep start/stop key 5, the data to be edited moves from No. 1 to the number set at Number of table 11 and then back again.

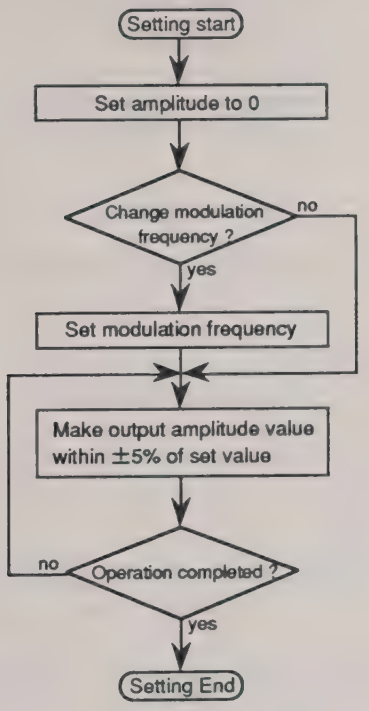
No. 1 ⇄ No. 2 ⇄ No. 3 ⇄ ---------- ⇄ No. X-1 ⇄ No. X

X : Number set at Number of table
⇄ : Interval time

Note: When sweeping is stopped by the Internal sweep start/stop key 5 or trigger input, the data at the time sweeping stopped is output.

Amplitude setting procedure

When the modulation frequency and the amplitude values are changed, the amplitude of output jitter at each point is set according to the following procedure.



Note: Because operation is carried out gradually every 200ms, it takes about 2 seconds to set the target amplitude value.

5. 13. 6 Tolerance

The modulation frequencies for several points are set and then the Tolerance at these point is measured automatically here.

[Setting items] The following items can be set.

- Modulation frequency
- No. of output data
- Range
- Interval time
- Tolerance start/stop

[Operation screen] The settings can be performed on the following screen.

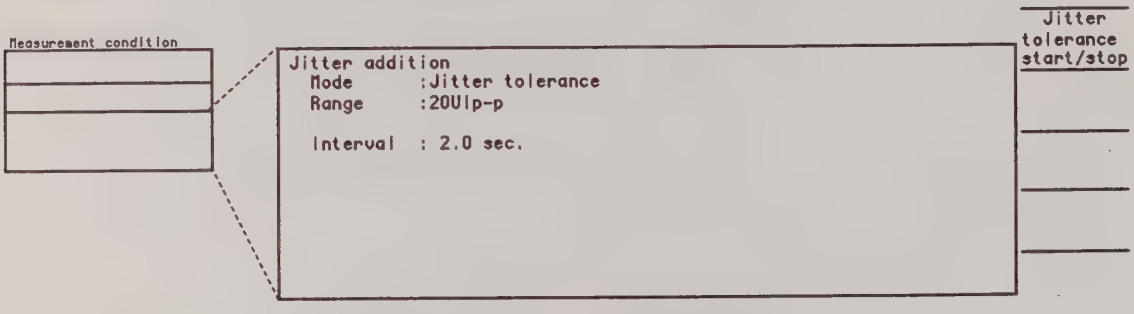
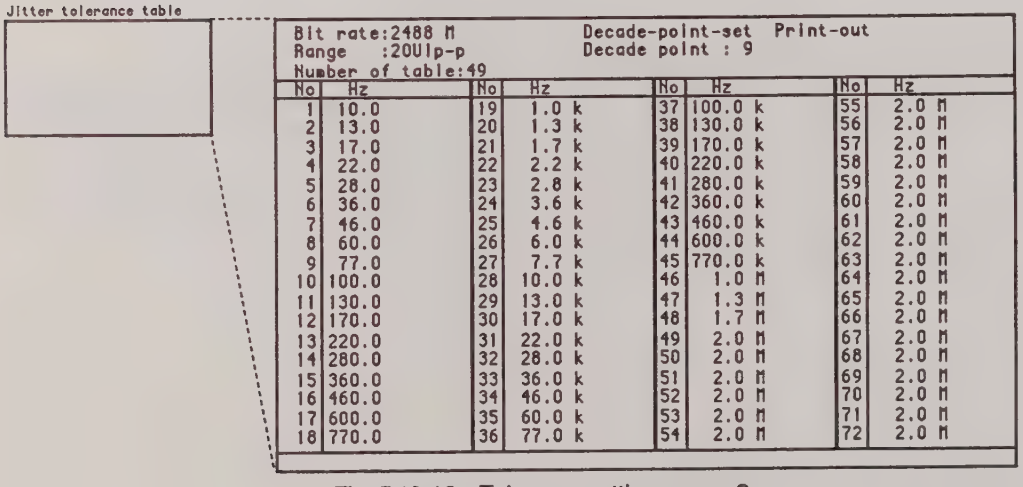


Fig. 5.13-15 Tolerance setting screen 1



No	Hz	No	Hz	No	Hz	No	Hz
1	10.0	19	1.0 k	37	100.0 k	55	2.0 M
2	13.0	20	1.3 k	38	130.0 k	56	2.0 M
3	17.0	21	1.7 k	39	170.0 k	57	2.0 M
4	22.0	22	2.2 k	40	220.0 k	58	2.0 M
5	28.0	23	2.8 k	41	280.0 k	59	2.0 M
6	36.0	24	3.6 k	42	360.0 k	60	2.0 M
7	46.0	25	4.6 k	43	460.0 k	61	2.0 M
8	60.0	26	6.0 k	44	600.0 k	62	2.0 M
9	77.0	27	7.7 k	45	770.0 k	63	2.0 M
10	100.0	28	10.0 k	46	1.0 M	64	2.0 M
11	130.0	29	13.0 k	47	1.3 M	65	2.0 M
12	170.0	30	17.0 k	48	1.7 M	66	2.0 M
13	220.0	31	22.0 k	49	2.0 M	67	2.0 M
14	280.0	32	28.0 k	50	2.0 M	68	2.0 M
15	360.0	33	36.0 k	51	2.0 M	69	2.0 M
16	460.0	34	46.0 k	52	2.0 M	70	2.0 M
17	600.0	35	60.0 k	53	2.0 M	71	2.0 M
18	770.0	36	77.0 k	54	2.0 M	72	2.0 M

Fig. 5.13-16 Tolerance setting screen 2

[Related items]

The following items are affected.

・The settings can be performed when the Jitter switch is ON.

The output jitter amount, output location, etc. can be monitored at the following screen.

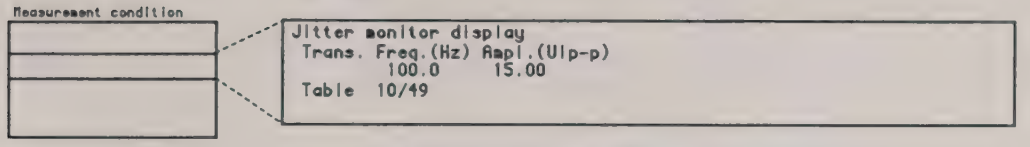
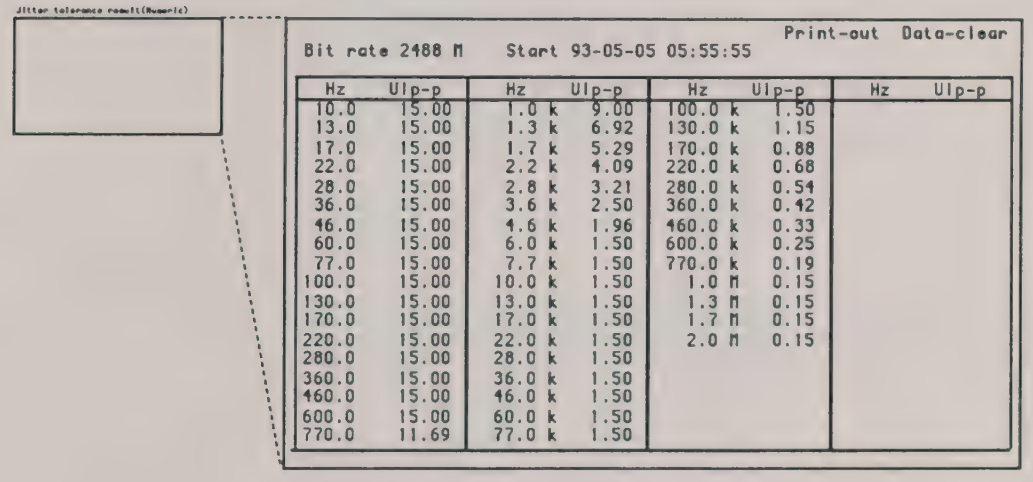


Fig. 5.13-17 Monitor screen

In addition, the result of Tolerance measurement can be checked at the following screen.



Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p
10.0	15.00	1.0 k	9.00	100.0 k	1.50		
13.0	15.00	1.3 k	6.92	130.0 k	1.15		
17.0	15.00	1.7 k	5.29	170.0 k	0.88		
22.0	15.00	2.2 k	4.09	220.0 k	0.68		
28.0	15.00	2.8 k	3.21	280.0 k	0.54		
36.0	15.00	3.6 k	2.50	360.0 k	0.42		
46.0	15.00	4.6 k	1.96	460.0 k	0.33		
60.0	15.00	6.0 k	1.50	600.0 k	0.25		
77.0	15.00	7.7 k	1.50	770.0 k	0.19		
100.0	15.00	10.0 k	1.50	1.0 M	0.15		
130.0	15.00	13.0 k	1.50	1.3 M	0.15		
170.0	15.00	17.0 k	1.50	1.7 M	0.15		
220.0	15.00	22.0 k	1.50	2.0 M	0.15		
280.0	15.00	28.0 k	1.50				
360.0	15.00	36.0 k	1.50				
460.0	15.00	46.0 k	1.50				
600.0	15.00	60.0 k	1.50				
770.0	11.69	77.0 k	1.50				

Fig. 5.13-18 Tolerance results (Numeric display)

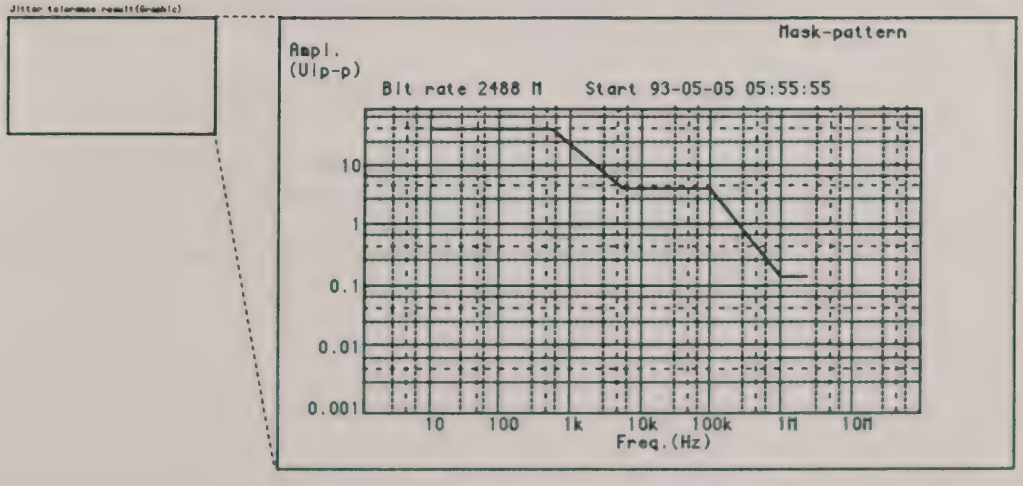


Fig. 5.13-19 Tolerance result (Graphic display)

●Measurement condition screen

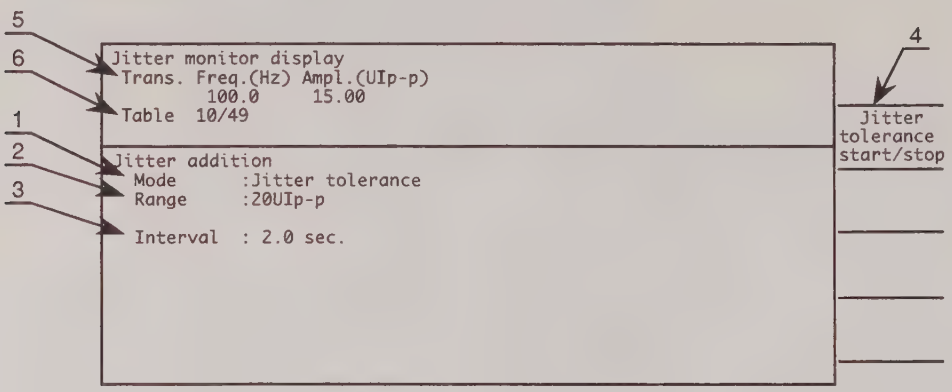


Fig. 5.13-20 Tolerance settings

Mode Sets the jitter generation mode as 1.
The setting range is as follows:

[Setting range] Jitter tolerance

Range Sets the jitter generation range as 2.
The setting range is as follows:

[Setting range] 2 UIp-p
20 UIp-p

Interval Sets the time required for receiving an external trigger signal at 3.
The setting range is as follows:

[Setting range] 0.1 ～ 10.0 sec ／ step 0.1

Note: When the receiver Output trigger setting is 1sec error, a setting of 2 seconds or more is required.

Jitter tolerance start/stop

Sets the jitter tolerance measurement to start and stop 4. Pressing the soft-key toggles the status alternately between start and stop.
The setting range is as follows:

[Setting range]

Start : Reverse displayed; Tolerance measurement starts
Stop : Normal display; Tolerance measurement stops

Note:

1. The status changes automatically to the Stop status when Tolerance measurement ends.
2. The status is changed by the following conditions from Start to Stop.
   - Bit rate of generated pattern
   - Mapping
   - Range 2, Interval 3
   - Number of table 9 on Jitter tolerance table screen
   - Table data during output

Trans. Freq.(Hz)
Ampl.(Ulp-p)

Monitors the amount of output jitter at 5.

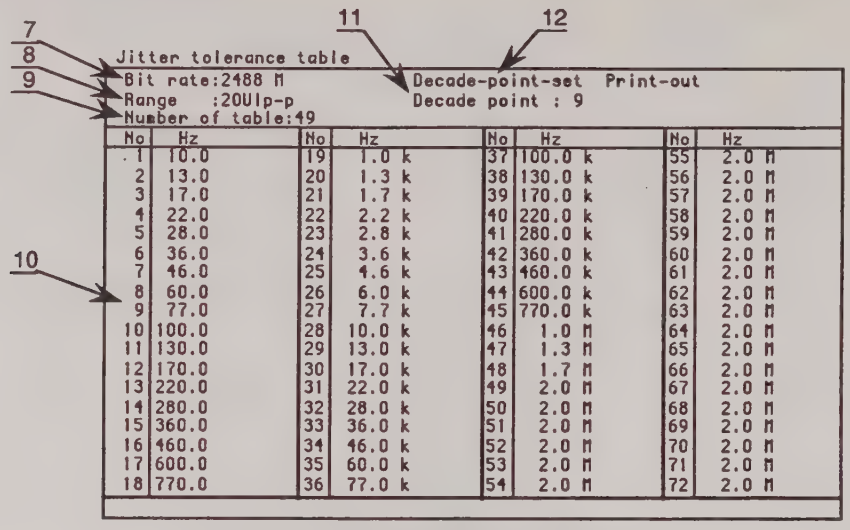
Note:

Refer to ■ Tolerance measurement for further details.

Table

Among all data, monitors the location currently being output at 6.

●Jitter tolerance table screen



No	Hz	No	Hz	No	Hz	No	Hz
1	10.0	19	1.0 k	37	100.0 k	55	2.0 M
2	13.0	20	1.3 k	38	130.0 k	56	2.0 M
3	17.0	21	1.7 k	39	170.0 k	57	2.0 M
4	22.0	22	2.2 k	40	220.0 k	58	2.0 M
5	28.0	23	2.8 k	41	280.0 k	59	2.0 M
6	36.0	24	3.6 k	42	360.0 k	60	2.0 M
7	46.0	25	4.6 k	43	460.0 k	61	2.0 M
8	60.0	26	6.0 k	44	600.0 k	62	2.0 M
9	77.0	27	7.7 k	45	770.0 k	63	2.0 M
10	100.0	28	10.0 k	46	1.0 M	64	2.0 M
11	130.0	29	13.0 k	47	1.3 M	65	2.0 M
12	170.0	30	17.0 k	48	1.7 M	66	2.0 M
13	220.0	31	22.0 k	49	2.0 M	67	2.0 M
14	280.0	32	28.0 k	50	2.0 M	68	2.0 M
15	360.0	33	36.0 k	51	2.0 M	69	2.0 M
16	460.0	34	46.0 k	52	2.0 M	70	2.0 M
17	600.0	35	60.0 k	53	2.0 M	71	2.0 M
18	770.0	36	77.0 k	54	2.0 M	72	2.0 M

Fig. 5.13-21 Jitter tolerance table settings

Bit rate Sets the Bit rate of the data to be edited at 7.
The setting range is as follows:

[Setting range] 52 M
156 M
622 M
2488 M

Range Sets the Range of the data to be edited at 8.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Note: The Bit rate 7 and the Range 8 can be set irrespective of the Measurement condition screen. However, for the output data, the Bit rate and the Range are determined by the Measurement condition screen.

Number of table Sets the number of data to be output at 9.
The setting range is as follows:

[Setting range] 1 ~ 72 points / step 1

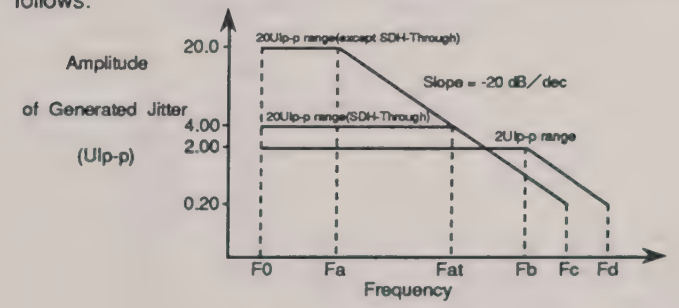
Hz Sets the modulation frequency at 10.
The setting range is as follows:

[Setting range] 10 Hz ~ 20 MHz

Frequency			Resolution
10	~	99	1
100	~	990	10
1k	~	9.9k	100
10k	~	99k	1k
100k	~	990k	10k
1M	~	9.9M	100k
10M	~	20M	1M

Note: The frequency cannot be set lower than frequency of previous table No..

<Restrictions> The frequency and output amplitude setting range are restricted by as follows:



Bit rate	F0[Hz]	Fa[Hz]	Fat[Hz]	Fb[Hz]	Fc[Hz]	Fd[Hz]
52 M	10	2k	10k	50k	200k	500k
156 M	10	5k	25k	150k	500k	1.5M
622 M	10	20k	100k	600k	2M	6M
2488 M	10	20k	100k	2M	2M	20M

Decade point

Sets the No. of output points in one decade at 11.
The setting range is as follows:

[Setting range] 1 ~ 9 / step 1

Decade-point-set

At the currently-set Bit rate 7, sets the modulation frequencies based on the Decade point 11 as a set at 12.
The table below shows the relationship between the decade point and modulation frequency.

Point No.	Decade data									
	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10
1	1.0	10.0								
2	1.0	3.2	10.0							
3	1.0	2.2	4.6	10.0						
4	1.0	1.8	3.2	5.6	10.0					
5	1.0	1.6	2.5	4.0	6.3	10.0				
6	1.0	1.5	2.2	3.2	4.6	6.8	10.0			
7	1.0	1.3	1.9	2.7	3.7	5.2	7.2	10.0		
8	1.0	1.3	1.8	2.4	3.2	4.2	5.6	7.5	10.0	
9	1.0	1.3	1.7	2.2	2.8	3.6	4.6	6.0	7.7	10.0

(Example) Bit rate : 2488M
Decade point : 2

No.	Hz
1	10
2	32
3	100
4	320
5	1k
6	3.2k
7	10k
8	32k
9	100k
10	320k
11	1.0M
12	3.2M
13	10.0M
14	20.0M
:	:
:	:
72	20.0M

Note:

1. The other Bit rate setting is not affected.
2. When executing Decade-point-set, settings made up to that time at the set Bit rate are erased. If necessary, save settings to Local memory or floppy disk.

■Tolerance measurement

Measurement

Raises the amplitude gradually 0 UIp-p, and measures the jitter resistance in the modulation frequency at 10. In addition, the limit value is detected by the external trigger.
The measurement item is as follows:

[Measurement item] Maximum amplitude

Fig. 5.13-22 Monitor screen

Trans. Freq.(Hz)

Displays the modulation frequency at 5.
The display format is as follows:

[Display format]

Modulation frequency			Display format
10	~	990	###. #
1k	~	990k	###. #k
1M	~	20M	###. #M

Ampl.(UIp-p)

Displays the output amplitude at 5.
The display format is as follows:

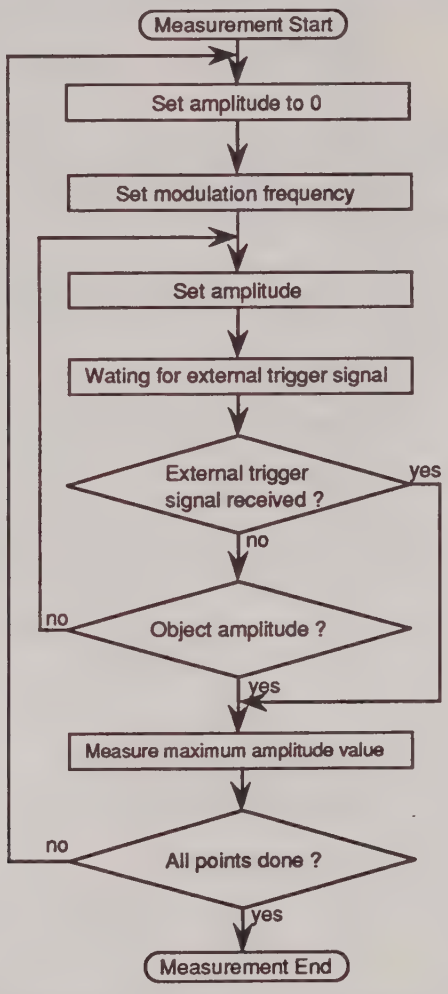
[Display format]

Generated pattern Type	Range	Normal display	Abnormal display (Overflow)
–	2 UIp-p	#. ###	>2.020
Except SDH-Through	20 UIp-p	##. ##	>20.20
SDH-Through		##. ##	>4.00

– : Don't care

Measurement procedure

Tolerance measurement method is as follows:



Tolerance Start/Stop

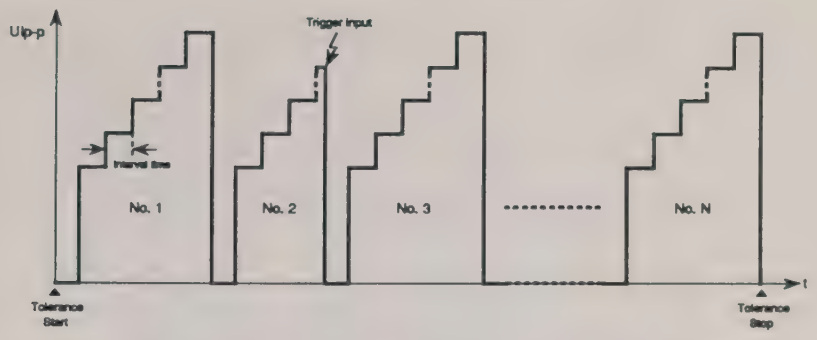
When starting tolerance measurement with the Jitter tolerance start/stop key 4, the tolerance table data from No. 1 to the number set at Number of table 9 are output as shown below.

Note:

1. At the end of tolerance measurement, the status changes to the Stop status (Table No. 1 modulation frequency, amplitude 0 Ulp-p).
2. If execution is stopped with the Jitter tolerance start/stop key 4, the status is modulation frequency of the table No. at which execution was stopped, amplitude 0 Ulp-p.

Setting amplitude

Sets the amplitude for each point as shown below.



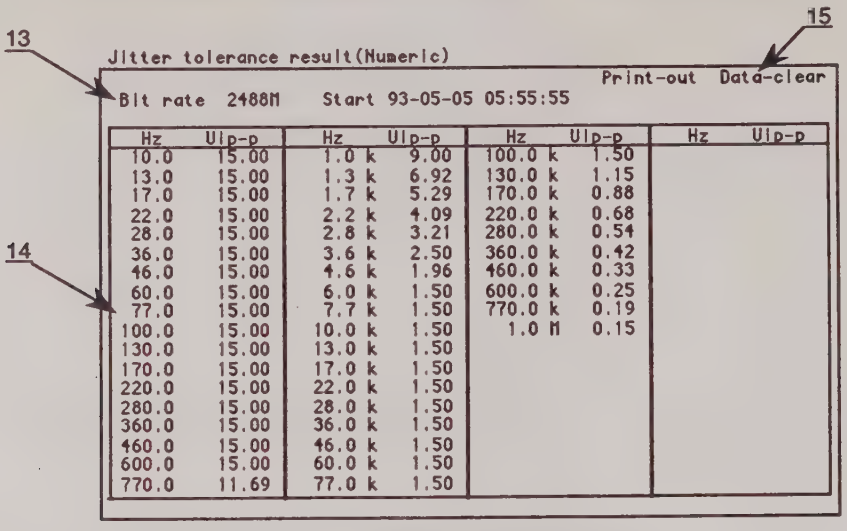
The amplitude value increases gradually starting from 0 Ulp-p until a trigger signal is received of the maximum settable amplitude is reached for that particular modulation frequency setting.

Note:

1. Always connect the Ext. Trigger Input connector. In addition, refer to section 1.6 Specifications for the signal conditions.
2. Sets the interval time to a suitable value for the response time of the DUT.

■Tolerance results

<Numeric display>



Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p
10.0	15.00	1.0 k	9.00	100.0 k	1.50		
13.0	15.00	1.3 k	6.92	130.0 k	1.15		
17.0	15.00	1.7 k	5.29	170.0 k	0.88		
22.0	15.00	2.2 k	4.09	220.0 k	0.68		
28.0	15.00	2.8 k	3.21	280.0 k	0.54		
36.0	15.00	3.6 k	2.50	360.0 k	0.42		
46.0	15.00	4.6 k	1.96	460.0 k	0.33		
60.0	15.00	6.0 k	1.50	600.0 k	0.25		
77.0	15.00	7.7 k	1.50	770.0 k	0.19		
100.0	15.00	10.0 k	1.50	1.0 M	0.15		
130.0	15.00	13.0 k	1.50				
170.0	15.00	17.0 k	1.50				
220.0	15.00	22.0 k	1.50				
280.0	15.00	28.0 k	1.50				
360.0	15.00	36.0 k	1.50				
460.0	15.00	46.0 k	1.50				
600.0	15.00	60.0 k	1.50				
770.0	11.69	77.0 k	1.50				

Fig. 5.13-23 Results screen (Numeric)

Bit rate
Start

Displays the measurement condition at 13.

- Bit rate : Measurement Bit rate
- Start : Measurement start time

Hz , Ulp-p

Displays the tolerance measurement result at 14.

Note:

1. Only points for which measurement has finished are displayed.
2. For display formats, refer to ■Tolerance measurement Trans. Freq. (Hz) and Ampl. (Ulp-p).

Data-clear

Clears the tolerance measurement conditions 13 and measured results 14 at 15.

Note:

The graphic display is also cleared.

<Graphic display>

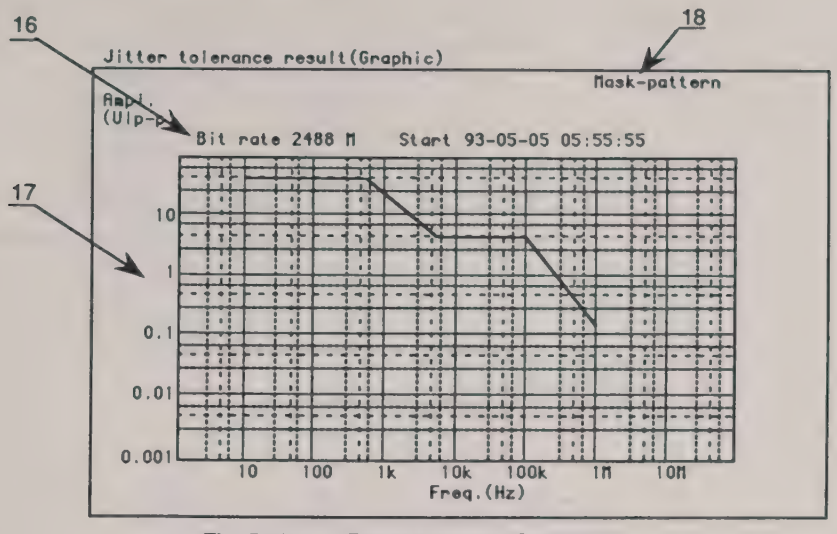


Fig. 5.13-24 Results screen (Graphic)

Bit rate
Start

Displays the measurement conditions at 16.

Bit rate : Measurement Bit rate
Start : Measurement start time

(Graph)

The tolerance measurement results are displayed graphically (Log-Log) at 17.
In addition, with Log scales, 3, 5, 7 and 10 are displayed on both the x- and y- axes.

Note: The start of measuring tolerance or the execution of Data-clear in the Numeric screen clears graphs.

Mask-pattern

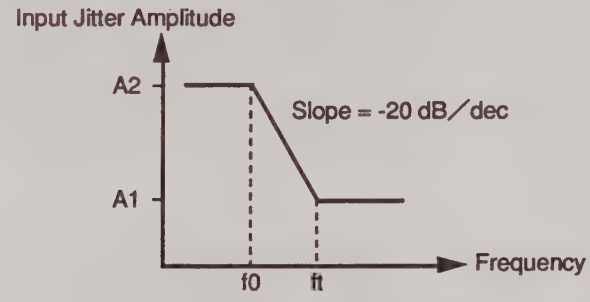
Displays mask patterns specified by G.958 at 18.
The setting range is as follows:

[Setting range]
OFF
STM-1 (A)
STM-1 (B)
STM-4 (A)
STM-4 (B)
STM-16 (A)
STM-16 (B)

Note: The setting range is restricted by the Bit rate in the Measurement condition screen as follows:

Bit rate	Setting range		
52 M	OFF		
156 M	OFF	STM-1(A)	STM-1(B)
622 M	OFF	STM-4(A)	STM-4(B)
2488 M	OFF	STM-16(A)	STM-16(B)

G. 958 Jitter tolerance masks are specified as follows:



STM level (Type)	ft(kHz)	f0(kHz)	A1(UIp-p)	A2(UIp-p)
STM-1 (A)	65	6.5	0.15	1.5
STM-1 (B)	12	1.2	0.15	1.5
STM-4 (A)	250	25	0.15	1.5
STM-4 (B)	12	1.2	0.15	1.5
STM-16 (A)	1000	100	0.15	1.5
STM-16 (B)	12	1.2	0.15	1.5

5. 13. 7 External

This function generates jitter by means of an external modulation signal input to the Ext. Jitter Mod. input connector.

[Setting items] The setting items can be set.

- Mode
- Range

[Operation screen] The settings can be performed on the following screen.

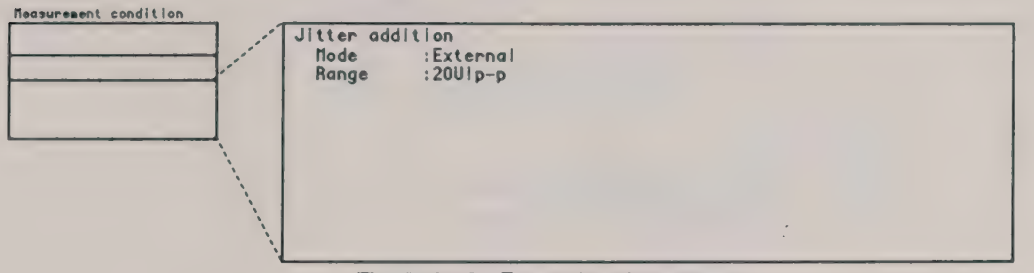


Fig. 5.13-25 External setting screen

[Related items] The following item is affected.

・The settings can be performed when the Jitter switch is ON.

In addition, the amount of output jitter can be monitored at following screen.

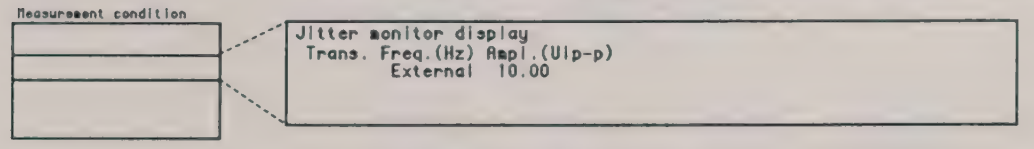


Fig. 5.13-26 Monitor screen

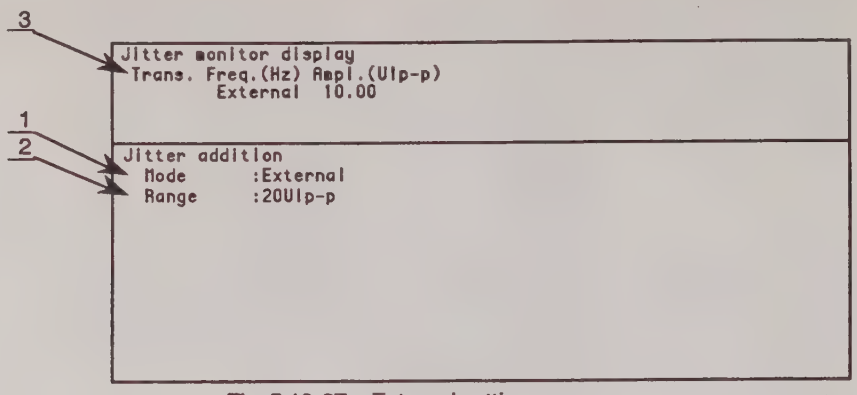


Fig. 5.13-27 External settings

Mode Sets the jitter generation mode as 1.
The setting range is as follows:

[Setting range] External

Range Sets the jitter generation range as 2.
The setting range is as follows:

[Setting range] 2 Ulp-p
20 Ulp-p

Trans. Freq.(Hz) Ampl.(Ulp-p) Monitors the amount of output jitter as 3.

Note:
1. The modulation frequency cannot be monitored.
2. Refer to ■Jitter generation for further details.

■ Jitter generation

Trans. Freq. (Hz)

Displays the modulation frequency at 3.
The display format is fixed at External.

Ampl.(UIp-p)

Displays the output amplitude at 3.
The display format is as follows:

[Display format]

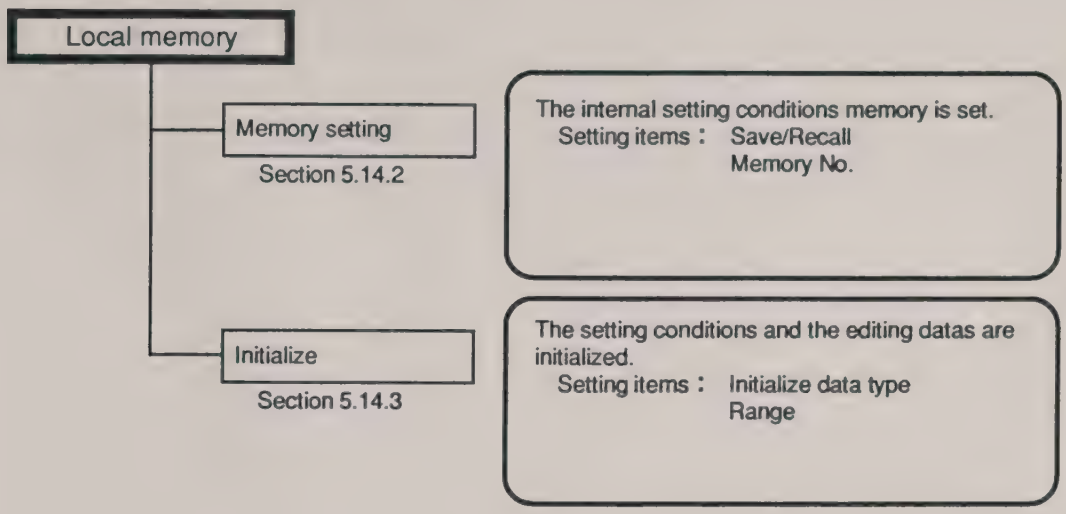
Generated pattern Type	Range	Normal display	Abnormal display (Overflow)
–	2 UIp-p	##. ###	>2.020
Except SDH-Through	20 UIp-p	###. ##	>20.20
SDH-Through		###. ##	>4.00

– : Don't care

5. 14 Setting Local memory

5. 14. 1 List of functions

The saves to/recalls from the internal setting conditions memory or initializes each setting condition.
The Local memory functions are listed below.



5. 14. 2 Setting memory

The internal setting conditions memory is set here.

[Setting items] The following items can be set.

- Save
- Recall
- Memory No.

[Operation screen] The settings can be performed on the following screen.

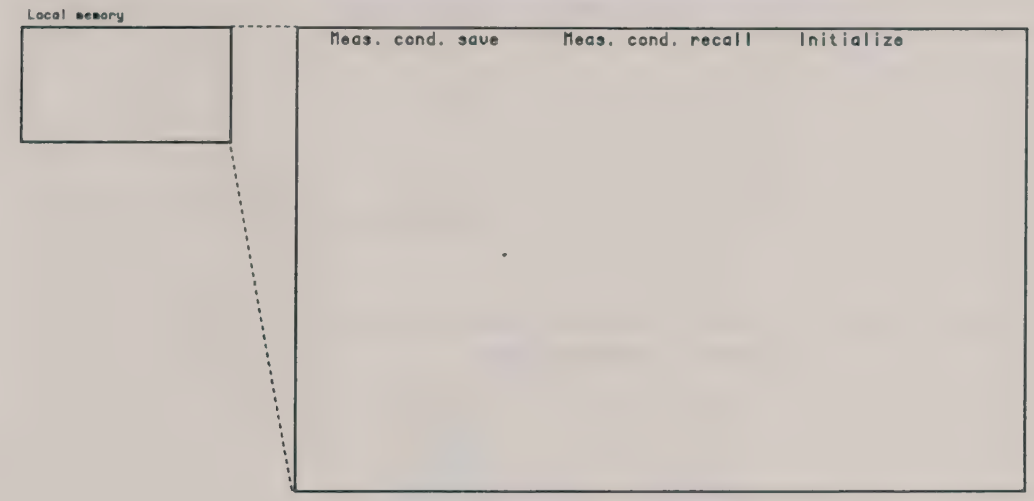


Fig. 5.14-1 Memory setting screen

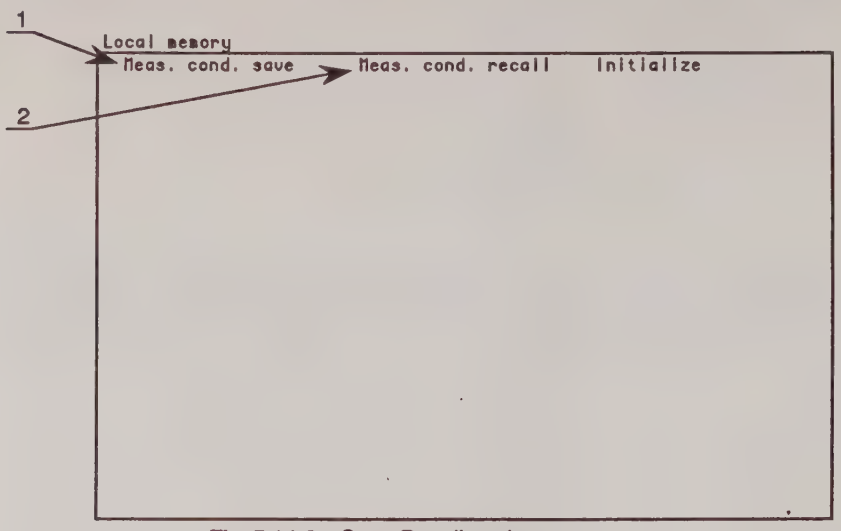


Fig. 5.14-2 Save/Recall settings

Meas. cond. save

Sets the memory saved the setting conditions at 1.
The setting range is as follows:

[Setting range]
Memory 1
Memory 2
Memory 3
Memory 4
Memory 5
Memory 6
Memory 7
Memory 8

Note:

1. Saving is not performed under following conditions:
   - Each PRGM data
   - Alarm, Bit error, Parity/FEBE error, Pointer test and Jitter start/stop function-keys
   - System conditions (section 5.17)
2. Saving to memory uses the overwrite method so make sure that the previous data is not required before saving the new data. If necessary, saves to floppy disk.

Meas. cond. recall

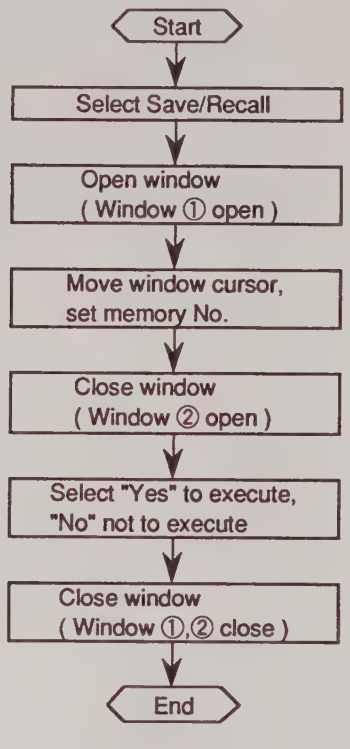
Sets the memory recalled the setting conditions at 2.
The setting range is as follows:

[Setting range]
Memory 1
Memory 2
Memory 3
Memory 4
Memory 5
Memory 6
Memory 7
Memory 8

Note:

1. There are no effect under following conditions:
   - Each PRGM data
   - System conditions (section 5.17)
2. When recalled from memory, Alarm, Bit error, Parity/FEBE error, Pointer test and Jitter start/stop function-keys are set to OFF (not reverse displayed).
3. When the memory contents are recalled in the case nothing is saved memory, the equipment status is set to the default.
4. The memory is fully initialized when the specifications are changed.

[Setting procedure] The setting procedure is as follows:



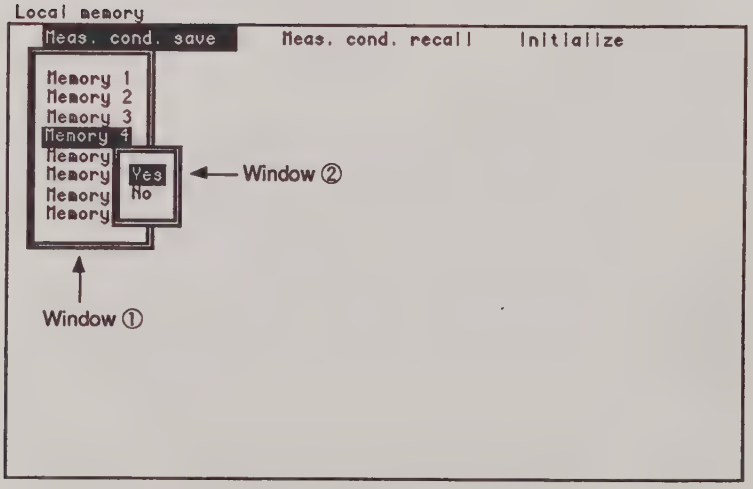


Fig. 5.14-3 Memory settings

5. 14. 3 Initialize

Each of the setting conditions are initialized here.

[Setting items] The following item can be set.

- Initialize data type

[Operation screen] The settings can be performed on the following screen.

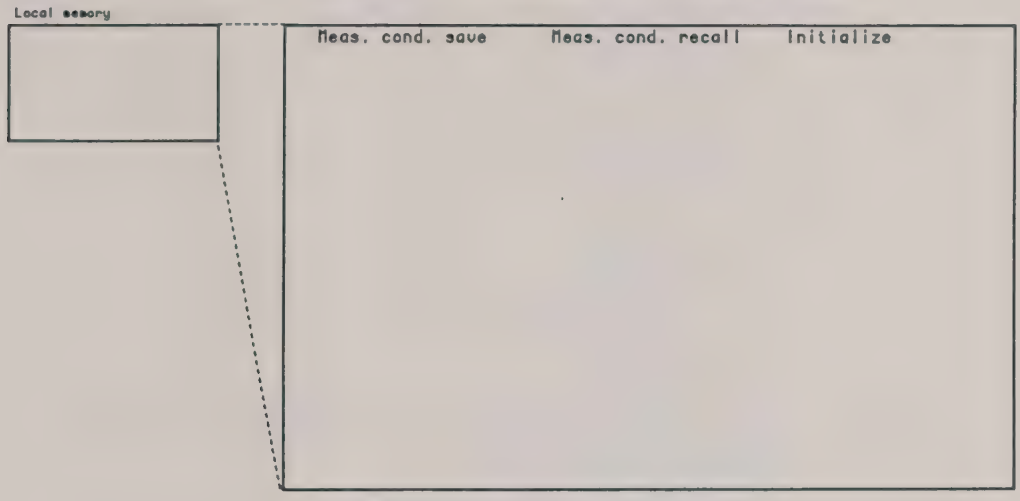
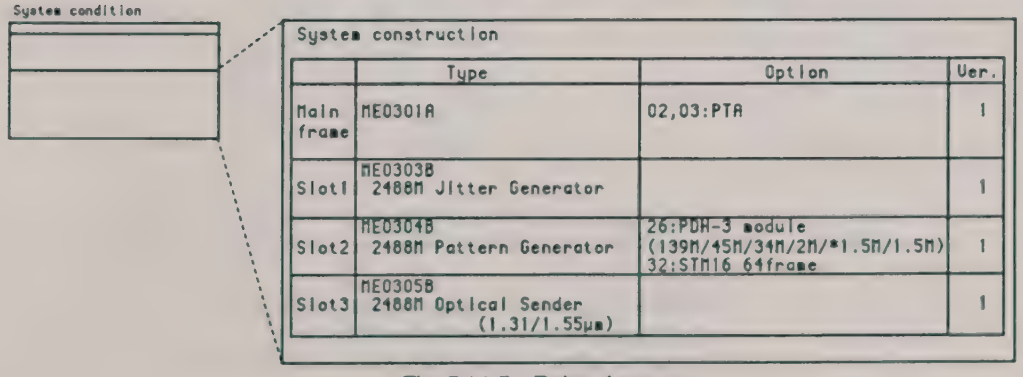


Fig. 5.14-4 Initialize setting screen

[Related items] The following items are affected.

- Presence/absence of ME0303A/B unit mount on slot 1
- Presence/absence of electrical option-25/26 or -31/32

In addition, the unit and option status can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0303B 2488M Jitter Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.14-5 Related screen

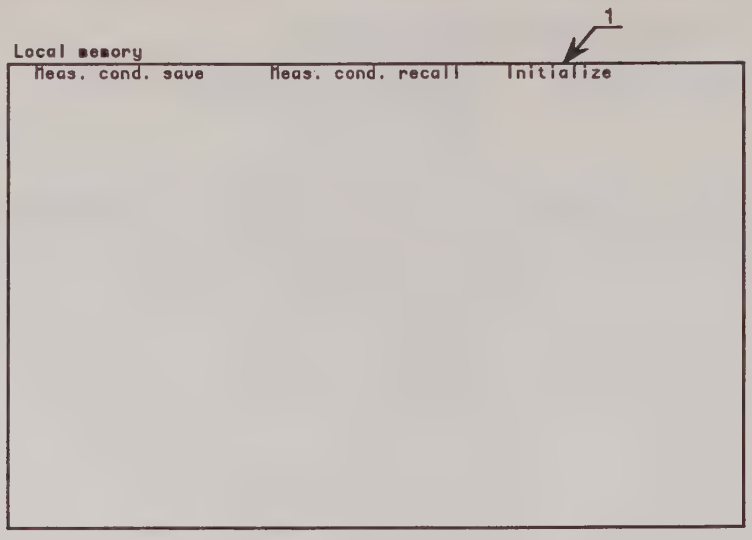


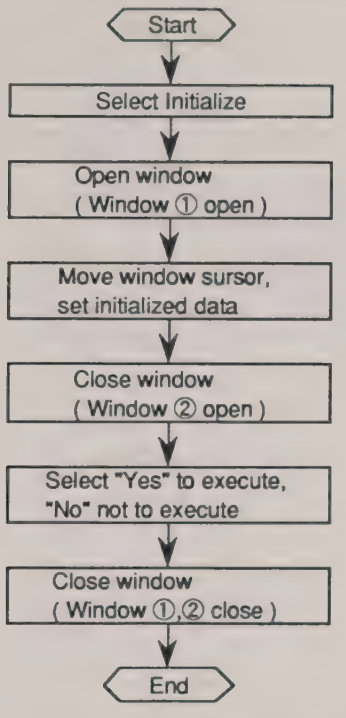
Fig. 5.14-6 Initialize

Initialize Sets the initializing measurement condition and each editing data at 1. The setting range is as follows:

[Setting range]
- Measurement condition
- PRGM SOH/POH preset data
- PRGM STM1 payload data
- PRGM STM0 (52M) payload data
- PRGM SOH 64-frame data
- PRGM POH 64-byte data
- PRGM pointer 64-frame data
- PRGM frame data
- Jitter sweep table
- Jitter tolerance table
- Jitter tolerance result
- PRGM CRC-7 data
- all data

Note:
1. Measurement condition initialize only parameter of Measurement condition screen.
2. The PRGM frame data can be set when the Type of generated pattern is PRGM frame data. (see section 5.9)
3. The Jitter relation data can be set when ME0303A/B unit is mounted on slot 1.
4. PRGM CRC-7 data can be set when electric option-25 or -26 is instoled.
4. "all data" is initialized all the items displayed in the window at the same time.

[Setting procedure] The setting procedure is as follows:



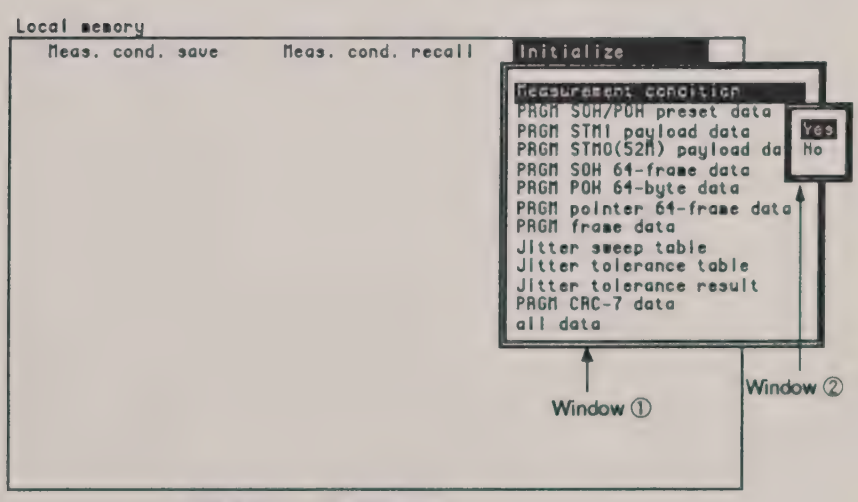
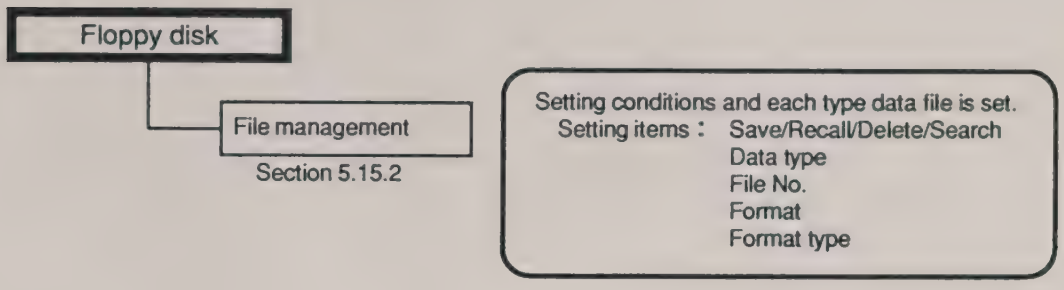


Fig. 5.14-7 Data settings

5. 15 Setting Floppy Disk

5. 15. 1 List of functions

Saves/Recalls/Deletes/Searches files for each setting condition and formats floppy disk.
The floppy disk functions are listed below.



5. 15. 2 File management

Setting of Floppy disk is set here.

[Setting items]

The following items can be set.

- File save/recall/delete/search
- FD format
- Data type
- File No.
- Format type

[Operation screen]

The settings can be performed on the following screen.

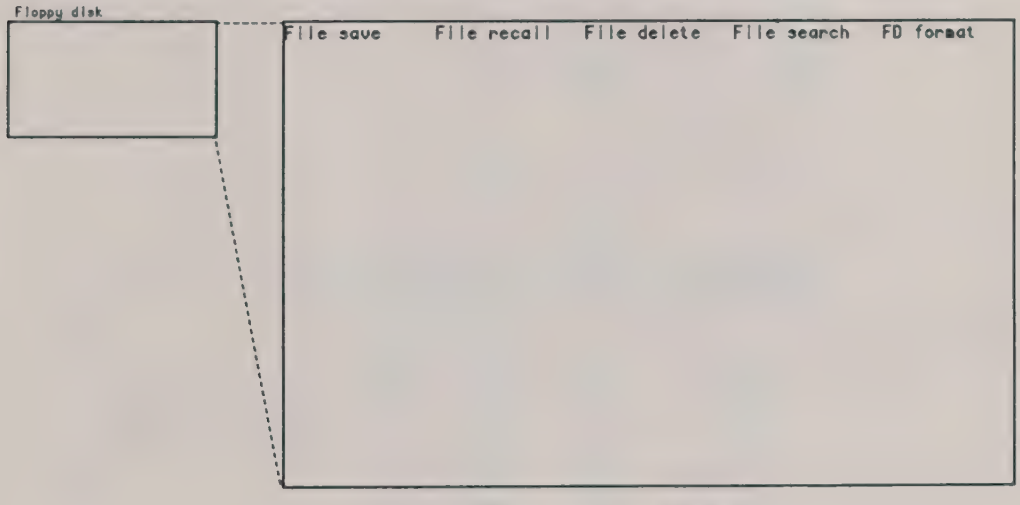


Fig. 5.15-1 File management screen

[Related items]

The following items are affected.

- Presence/absence of ME0303A/B unit mount on slot 1
- Presence/absence of electrical option-25/26 or -31/32

In addition, the unit and option status can be confirmed at the following screen.

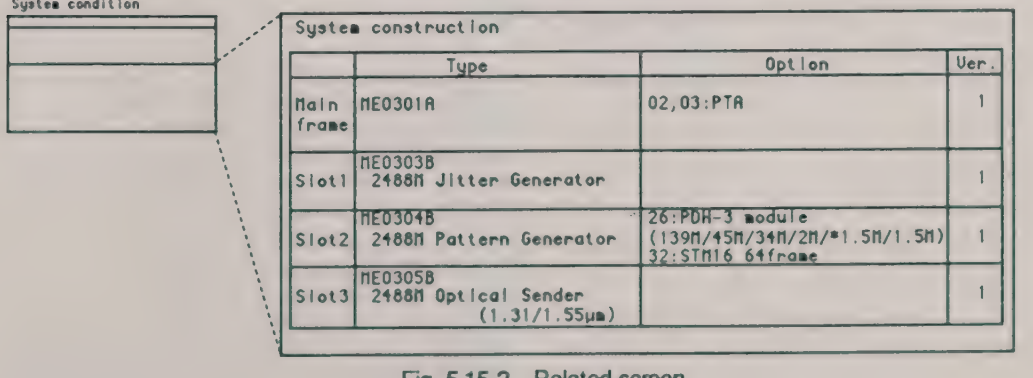


Fig. 5.15-2 Related screen

●File save

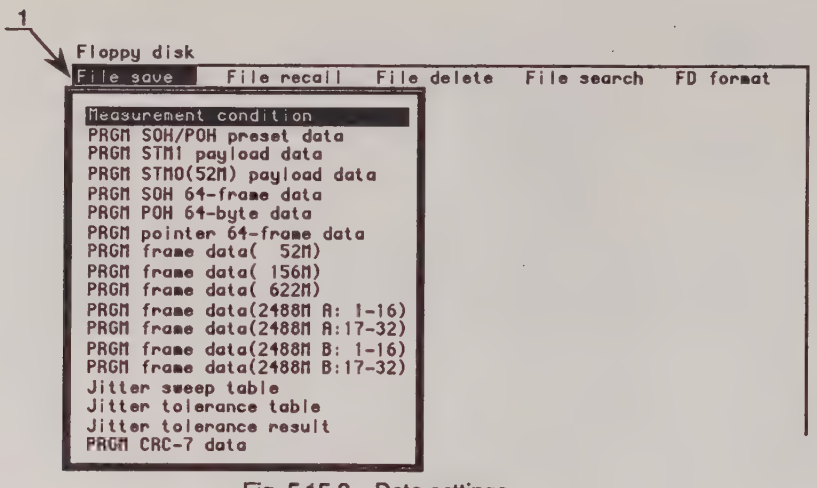


Fig. 5.15-3 Data settings

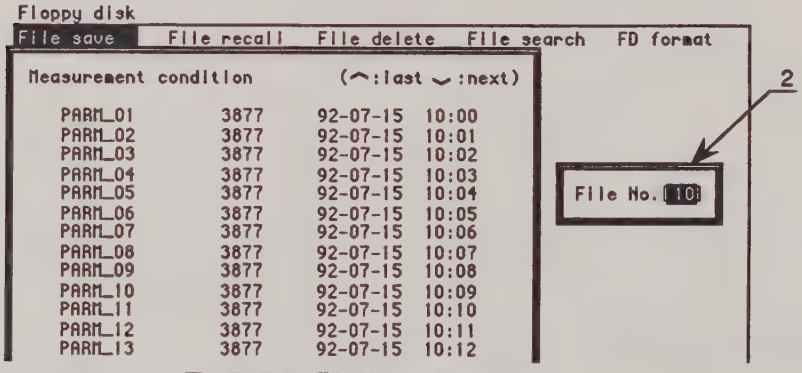


Fig. 5.15-4 File No. settings

File save Sets the saved data to floppy disk at 1.
The setting range is as follows:

[Setting range]
- Measurement condition
- PRGM SOH/POH preset data
- PRGM STM1 payload data
- PRGM STM0 (52M) payload data
- PRGM SOH 64-frame data
- PRGM POH 64-byte data
- PRGM pointer 64-frame data
- PRGM frame data (52M)
- PRGM frame data (156M)
- PRGM frame data (622M)
- PRGM frame data (2488M A : 1-16)
- PRGM frame data (2488M A : 17-32)
- PRGM frame data (2488M B : 1-16)
- PRGM frame data (2488M B : 17-32)
- Jitter sweep table
- Jitter tolerance table
- Jitter tolerance result
- PRGM CRC-7 data

Note:

1. Measurement condition saves only Measurement condition screen parameter. However, the status of function key is not saved.
2. PRGM frame data can be set when electrical option-31 or 32 is mounted and the Type of gnerated pattern is PRGM frame data.
3. Jitter relation data can be set only when ME0303A/B unit is mounted on slot 1.
4. PRGM CRC-7 data can be set when electrical option-25 or 26 is instolled.

File No.

Sets the file name (file No.) at 2.
The setting range is as follows:

[Setting range] 0 ～ 99 ／ step 1

Note:

1. The file name is specified according to the file No..
2. The file attribute is not displayed.
3. PRGM frame data can specify only the same Bit rate file as the Bit rate of generated pattern (→ section 5.9.2) . When another file is specified, the " Execution error " error message is displayed and execution cannot be performed.

●File recall

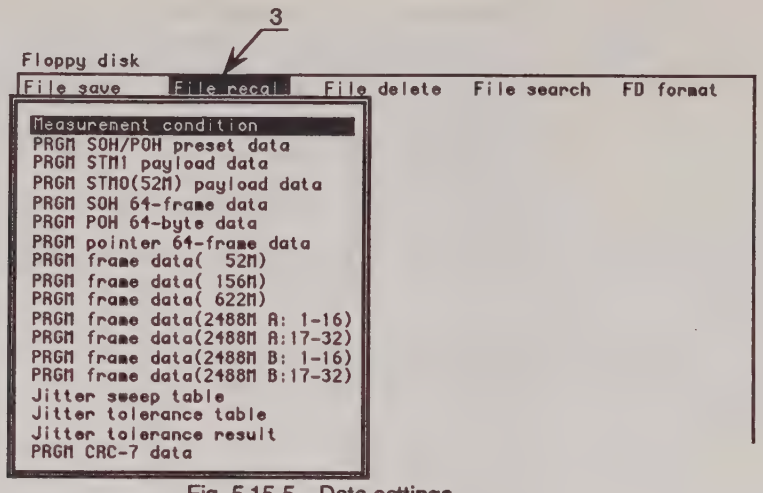


Fig. 5.15-5 Data settings

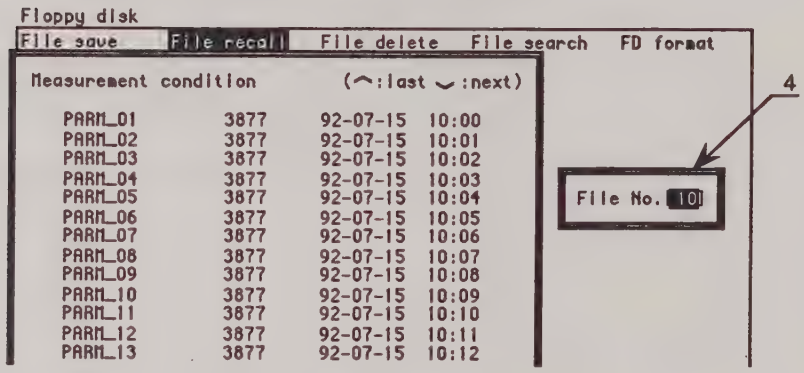


Fig. 5.15-6 File No. settings

File recall Sets the recalled data from floppy disk at 3.
The setting range is as follows:

[Setting range]
- Measurement condition
- PRGM SOH/POH preset data
- PRGM STM1 payload data
- PRGM STM0 (52M) payload data
- PRGM SOH 64-frame data
- PRGM POH 64-byte data
- PRGM pointer 64-frame data
- PRGM frame data (52M)
- PRGM frame data (156M)
- PRGM frame data (622M)
- PRGM frame data (2488M A : 1-16)
- PRGM frame data (2488M A : 17-32)
- PRGM frame data (2488M B : 1-16)
- PRGM frame data (2488M B : 17-32)
- Jitter sweep table
- Jitter tolerance table
- Jitter tolerance result
- PRGM CRC-7 data

Note:

1. When Measurement condition data read, the following function key set to OFF.
   - Pointer test
   - Alarm add
   - Bit error add
   - Parity/FEBE error add
   - Jitter start/stop
2. PRGM frame data can be set when electrical option-31 or 32 is mounted and the Type of gnerated pattern is PRGM frame data.
3. Jitter relation data can be set only when ME0303A/B unit is mounted on slot 1.
4. PRGM CRC-7 data can be set when electrical option-25 or 26 is instolled.

File No.

Sets th efile name (File No.) at 4.
The setting range is as follows:

[Setting range] 0 ～ 99 ／ step 1

Note:

1. The file name is specified according to the file No..
2. The file attribute is not displayed.
3. The ME3520A cannot read files saved by the ME3620A and vice versa.
4. PRGM frame data can specify only the same Bit rate file as the Bit rate of generated pattern (→ section 5.9.2) . When another file is specified, the " Execution error " error message is displayed and execution cannot be performed.

●File delete

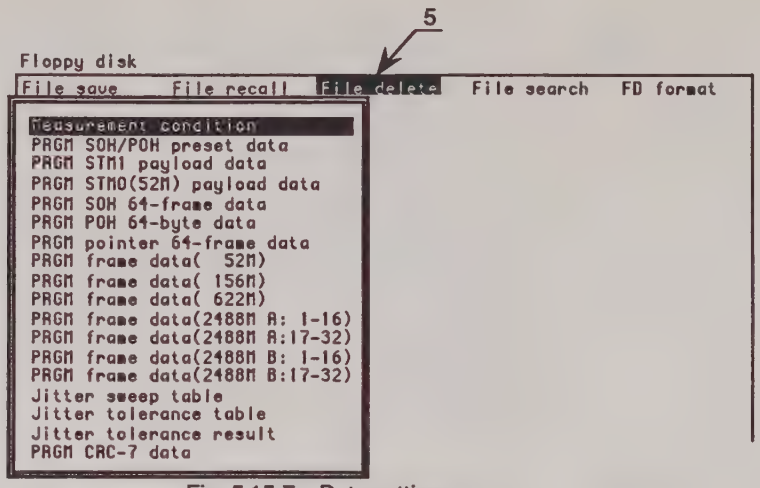


Fig. 5.15-7 Data settings

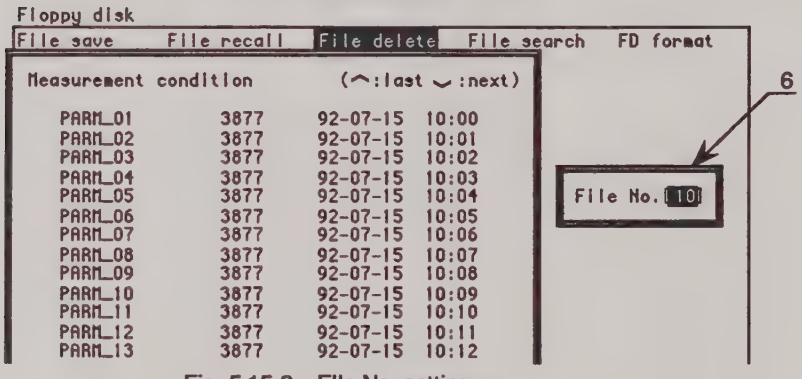


Fig. 5.15-8 FIle No. settings

File delete Sets the deleted data from floppy disk at 5.
The setting range is as follows:

[Setting range]
- Measurement condition
- PRGM SOH/POH preset data
- PRGM STM1 payload data
- PRGM STM0 (52M) payload data
- PRGM SOH 64-frame data
- PRGM POH 64-byte data
- PRGM pointer 64-frame data
- PRGM frame data (52M)
- PRGM frame data (156M)
- PRGM frame data (622M)
- PRGM frame data (2488M A : 1-16)
- PRGM frame data (2488M A : 17-32)
- PRGM frame data (2488M B : 1-16)
- PRGM frame data (2488M B : 17-32)
- Jitter sweep table
- Jitter tolerance table
- Jitter tolerance result
- PRGM CRC-7 data

Note:

1. PRGM frame data can be set when electrical option-31 or 32 is mounted and the Type of gnerated pattern is PRGM frame data.
2. Jitter relation data can be set only when ME0303A/B unit is mounted on slot 1.
3. PRGM CRC-7 data can be set when electrical option-25 or 26 is instolled.

File No.

Sets the file name (File No.) at 6.
The setting range is as follows:

[Setting range] 0 ~ 99 / step 1

Note:

1. The file name is specified according to the file No..
2. The file attribute is not displayed.
3. The ME3520A cannot delete files saved by the ME3620A and vice versa.

●File search

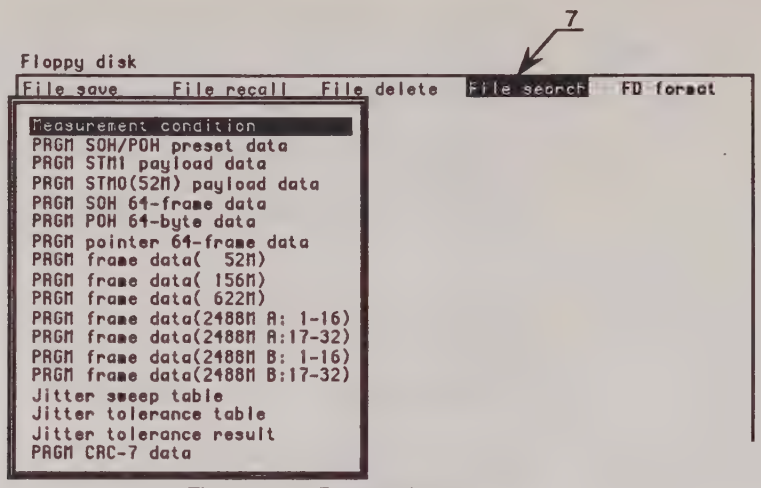


Fig. 5.15-9 Data settings

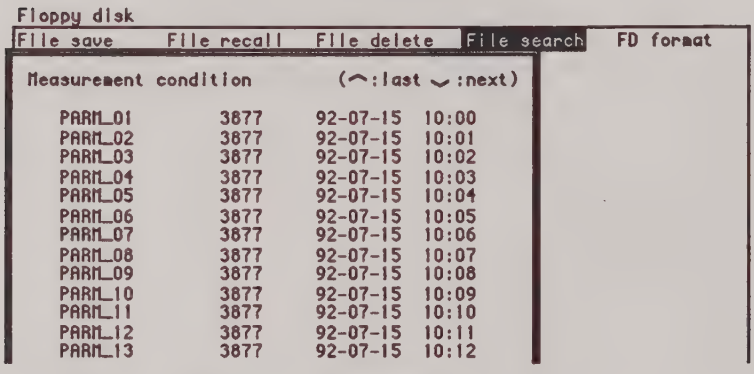


Fig. 5.15-10 File display

File search — Sets the searched data from floppy disk at 7.
The setting range and search contents as follows:

[Setting range]
- Measurement condition
- PRGM SOH/POH preset data
- PRGM STM1 payload data
- PRGM STM0 (52M) payload data
- PRGM SOH 64-frame data
- PRGM POH 64-byte data
- PRGM pointer 64-frame data
- PRGM frame data (52M)
- PRGM frame data (156M)
- PRGM frame data (622M)
- PRGM frame data (2488M A : 1-16)
- PRGM frame data (2488M A : 17-32)
- PRGM frame data (2488M B : 1-16)
- PRGM frame data (2488M B : 17-32)
- Jitter sweep table
- Jitter tolerance table
- Jitter tolerance result
- PRGM CRC-7 data

[Search contents]

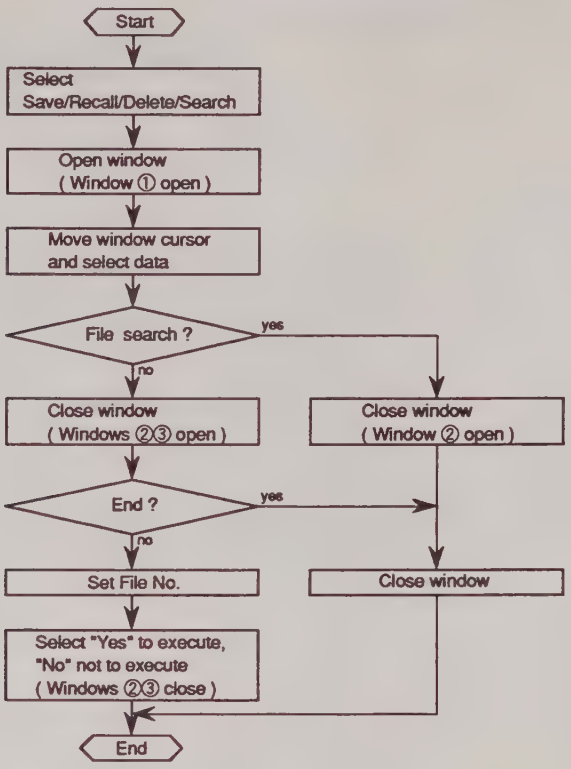
File	: File name File size File creation data
FD usage status	: FD capacity Used capacity Unused capacity
File No.	: Display file No. and file size (Byte No.)

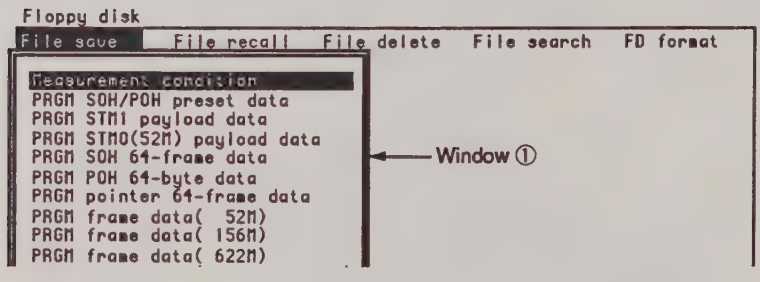
Note:

1. PRGM frame data can be set when electrical option-31 or 32 is mounted and the Type of gnerated pattern is PRGM frame data.
2. Jitter relation data can be set only when ME0303A/B unit is mounted on slot 1.
3. PRGM CRC-7 data can be set when electrical option-25 or 26 is instolled.
4. The ME3520A cannot searched files saved by the ME3620A and vice versa.
5. The file attribute is not displayed.

■Setting procedure

The setting procedure is as follows:





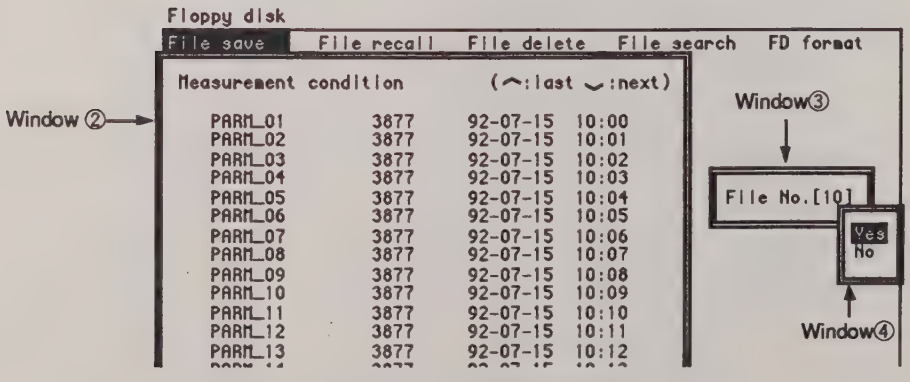


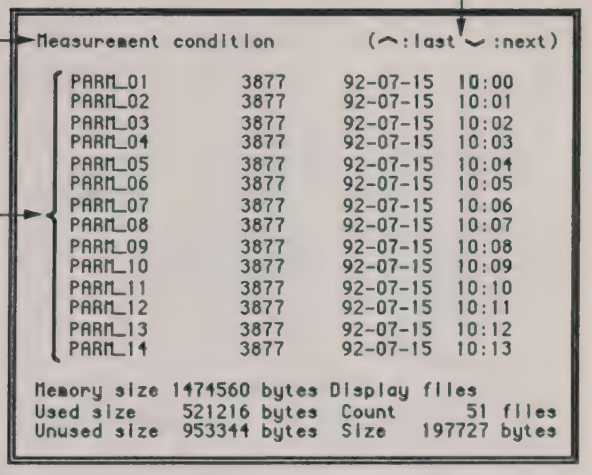
Fig. 5.15-11 Window display

The display contents at Window ② are as follows:

When there are more than 14 files altogether, displiay data can be performed by cursol move key ⌒/⌣ or step key ⌒/⌣ . And, you can performe line scroll by rotaly encoder.

Item selected in window ①.

List of currently existing files for item selected in window ①.



●FD format

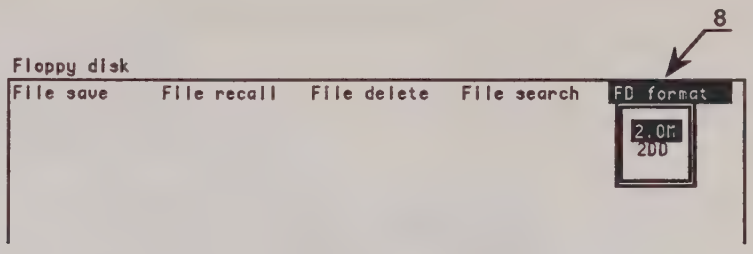


Fig. 5.15-12 Media type

FD format Sets the format type at 8.
The setting range is as follows:

[Setting range] 2.0M
2DD

Inaddition, the FD configuration after formatting is as follows:

Item	2DD	2.0M
Capacity (at formatting)	720 kB	1440 kB
Sector length	512	512
Sector No.	9	18
Track No.	80	80

Note:

1. After formatting is completed, the following processes are performed.
   - Make the following directory under the root directory.
     ME3520A : ME3520
     ME3620A : ME3620
   - Attach volume lavel of disk.
     ME3520A : ME3520
     ME3620A : ME3620
2. When formatting is executed, alll the data on the floppy disk is deleted so take care.

■File structure

Delectory

Access files under following delectories.

ME3520A : ¥ME3520¥TRANS¥SDH
ME3620A : ¥ME3620¥TRANS¥SDH

Note: Delectory ¥ME3520 or ¥ME3620 is created automatically at FD format execution. In addition, ¥TRANS¥SDH is created automatically at File save.

File

Each data file name and size is as follows:

Table 5.15-1 File size

Data	File name	Size (byte)	Data format
Measurement condition	PARM_**. PAR	3877	Binary
PRGM SOH/POH preset data	OHPRE_**. DAT	3870	
PRGM STM1 payload data	PLD1_**. DAT	2430	
PRGM STM0(52 M) payload data	PLD0_**. DAT	2430	
PRGM SOH 64-frame data	T_SOH_**. DAT	138510	
PRGM POH 64-byte data	T_OHB_**. DAT	540	
PRGM pointer 64-frame data	T_PTR_**. DAT	1036	
PRGM frame data (52M)	TX52_**. DAT	155520	
PRGM frame data (156M)	TX156_**. DAT	155520	
PRGM frame data (622M)	TX622_**. DAT	622080	
PRGM frame data (2488M A: 1-16)	TX24A_**. DAT	622080	
PRGM frame data (2488M A:17-32)	TX24B_**. DAT	622080	
PRGM frame data (2488M B: 1-16)	TX24C_**. DAT	622080	
PRGM frame data (2488M B:17-32)	TX24D_**. DAT	622080	
Jitter sweep table	JTSWP_**. DAT	6192	
Jitter tolerance table	JTTLT_**. DAT	4608	
Jitter tolerance result	JTTLD_**. DAT	442	ASCII
PRGM CRC-7 data	T_CRC_**. DAT	540	Binary

■File operation ◆Reading receiver file

The file logged and saved by the receiver is read as the transmitter editing data. Target data and procedure are as follows:

[Target data]

Transmitter data	Receiver data
PRGM SOH 64-frame data	Logged SOH frame data
PRGM POH 64-byte data	Logged SOH/POH byte data
PRGM frame data (52M)	Logged frame data (52M)
PRGM frame data (156M)	Logged frame data (156M)
PRGM frame data (622M)	Logged frame data (622M)
PRGM frame data (2488M A: 1-16)	Logged frame data (2488M 1-16)
PRGM frame data (2488M A:17-32)	Logged frame data (2488M 17-32)
PRGM frame data (2488M B: 1-16)	Logged frame data (2488M 33-48)
PRGM frame data (2488M B:17-32)	Logged frame data (2488M 49-64)

[Procedure] A file saved at the receiver cannot be read as it is at the transmitter. Consequentry, the FD must be edited at an external computer (MS-DOS) .

1. Create a directory in the transmitter.
   However, unnecessary if already created.

   (Example) ME3620A
   ME3620 TRANS SDH

2. Copy the file created at the receiver to the directory in the transmitter.

   (Example) Read Logged SOH frame data
   ME3620 RECEIV SDH L_SOH_**.DAT
   ↓ File copy
   ME3620 TRANS SDH L_SOH_**.DAT

3. Change the copied file name using the transmitter.

   (Example) Change name to SOH 64-frame data
   ME3620 TRANS SDH L_SOH_**.DAT
   ↓ File name changed
   ME3620 TRANS SDH T_SOH_**.DAT

After the above editing, the file can be read using File recall.

Note: When reading Logged frame data (2488M), execute for all the data in the 64-frame part.

◆ Reading MP1560A STM/SONET Analyzer files

The MP1560A frame memory (TX) file can be read as transmitter PRGM frame data.
Target data and procedure are as follows:

[Target data]

Transmitter data	MP1560A data
PRGM frame data (52M)	TX MEMORY 52M
PRGM frame data (156M)	TX MEMORY 156M

[Procedure]

A file saved at the MP1560A cannot be read as it is at the transmitter. Consequentry, the MP1560A FD must be edited at an external computer (MS-DOS).

1. Create a directory in the transmitter.
   However, unnecessary if already created.

   (Example) ME3620A
   ME3620 TRANS SDH

2. Copy the file saved at the MP1560A to the directory in the transmitter.

   (Example) Read TX MEMORY 52M
   MP1560 CCITT TX52 ＊＊. DAT
   ↓ File copy
   ME3620 TRANS SDH TX52 ＊＊. DAT

After the above editing, the file can be read using File recall.

■ Floppy disk fault and countermeasures

Fig. 5.15-13 Error message display

Error message

When an error occures during floppy disk operations, error message is displayed on the EL display. The display item is as follows:

[Display item]

- Write protected
- File full, Directory full
- File not found
- FD error
- Load error
- No option
- Version missmatch
- Execution error

Note: The error message is deleted when any enabled key is pressed.

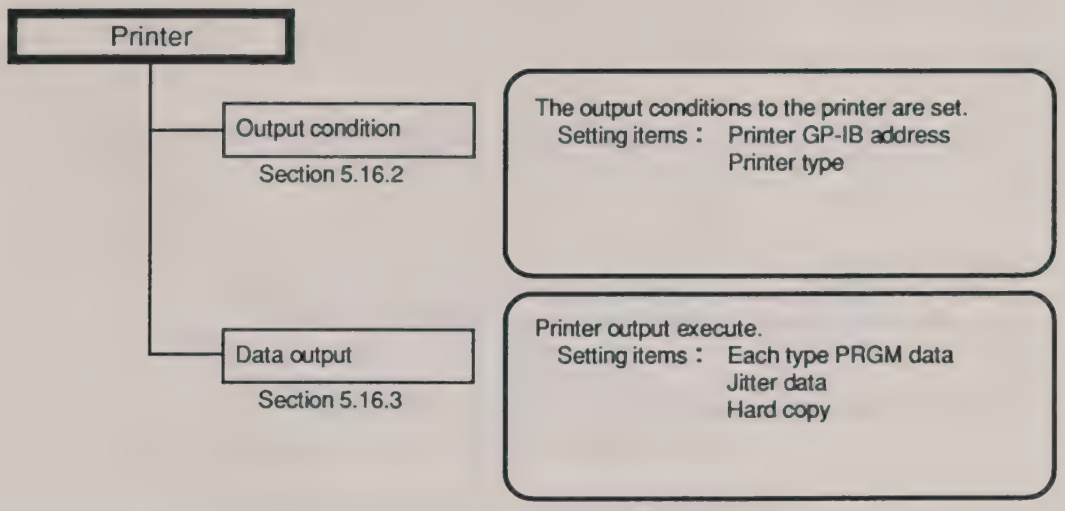
Table 5.15-2 Error messages and Responses

Messaage	Cause	Response
Write protected	The disk cannot be deleted and Written.	Change the disk to the writable condition.
File full, Directory full	There is insufficient empty space or No. of directories has been eecuted.	Delete some files of directories, or use different disk.
File not found	The specified file does not exist.	Confirm the file name and re-execute.
FD error	Disk wrongly inserted.	Re-execute affer checking the disk and settings.
	Disk not formatted.	
	Execute different format from disk type	
	File or disk error	Reexecute with a defferent file or disk. Suspect a hardware fault if the fault still recoccures.
	FDD fault	
Load error	The data area is damaged by misreading.	Reexecute with a same file or defferent file. Suspect a hardware fault if the fault still recoccures.
	When reading PRGM SOH 64-frame data file, Bit rate data is incorrect (T_SOH_**. DAT).	Re-execute; the data is abnormal if the error reoccurs.
No option	A 2488M PRGM SOH 64-frame data files was read with the ME3520A (T_SOH_**. DAT).	Read the file with a ME3520A or re-execute with ME3620A.
Version missmatch	Processing data error	Re-execute; the data is abnormal if the error reoccurs.
	Equipment FD processing version older than read version	Re-execute the equipment saved file or upgrade the application program version and re-execute.
	Saved file with ME3520A(ME3620A) read compulsory to ME3620A (ME3520A) with directory operation	Re-execute with same form name equipment as saved equipment
Execution error	When reading/writing the PRGM frame data, adefferent file Bit rate was specified from the equipment Bit rate.	Match the file Bit rate with the equipment Bit rate and re-execute.

5. 16 Setting printer

5. 16. 1 List of functions

Each type of edited data and screen data is output to an external printer from the GP-IB (GPIB2) interface. The printer setting functions are listed below.

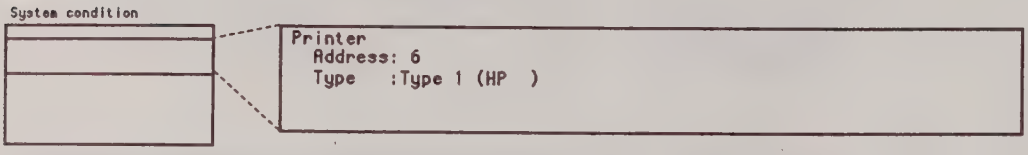


5. 16. 2 Setting output conditions

The output conditions to the printer are set here.

[Setting items] The following items can be set.

- Printer GP-IB address
- Printer type



[Operation screen] The setting can be performed on the following screen.

Fig. 5.16-1 Printer output condition setting screen

[Related items] The following item is affected.

・Printer address cannot be set same value as GP-IB2 address.

GP-IB2 address can be confirmed at the following screen.

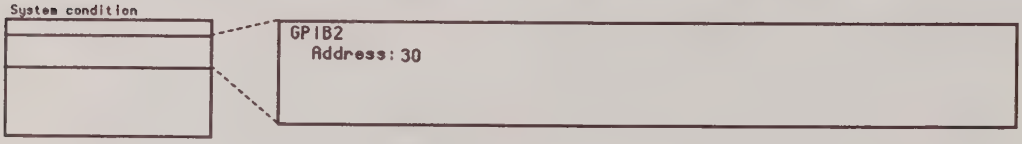


Fig. 5.16-2 Related screen

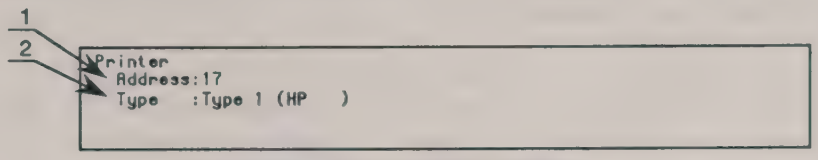


Fig. 5.16-3 Output condition settings

Address Sets the printer GP-IB address at 1.
The setting range is as follows:

[Setting range] 0 ~ 30 / step 1

Note: The address cannot be set to the value set for GPIB2 because outputting from the rear panel GP-IB2 connector.

Type Sets the printer type at 2.
The setting range is as follows:

[Setting range] Type 0 (EPSON)
Type 1 (HP)

Note: Following printers are supported by ME3520A/ME3620A.
- Japanese EPSON : FP-850
  With #8156 intelligent IEEE-488 interface board
- Overseas EPSON : CTM-800
  With #8156 intelligent IEEE-488 interface board
  Hewlett-Packard
  : HP2225AJ GP-IB interface specifications

5. 16. 3 Data output

The data is output to the printer here.

[Setting items]

The following items can be set.

Editing data
- ● PRGM SOH/POH preset data
- ● PRGM payload data
- ● PRGM SOH 64-frame data
- ● PRGM POH 64-byte data
- ● PRGM pointer 64-frame data
- ● PRGM frame data
- ● Jitter sweep table
- ● Jitter tolerance table
- ● PRGM CRC-7 data

Measurement data
- ● Jitter tolerance result

Screen data
- ● Hard copy

[Operation screen]

The setting can be performed as follows for data type.

- ● Editing data — Set Print-out in screen.
- ● Measurement data
- ● Screen data — Press front-panel Hard Copy key.

[Related items]

The following items are affected.

- Presence/absence of ME0303A/B unit mount on slot 1
- Presence/absence of electrical option-25/26 or -31/32

In addition, the unit and option status can be confirmed at the following screen.

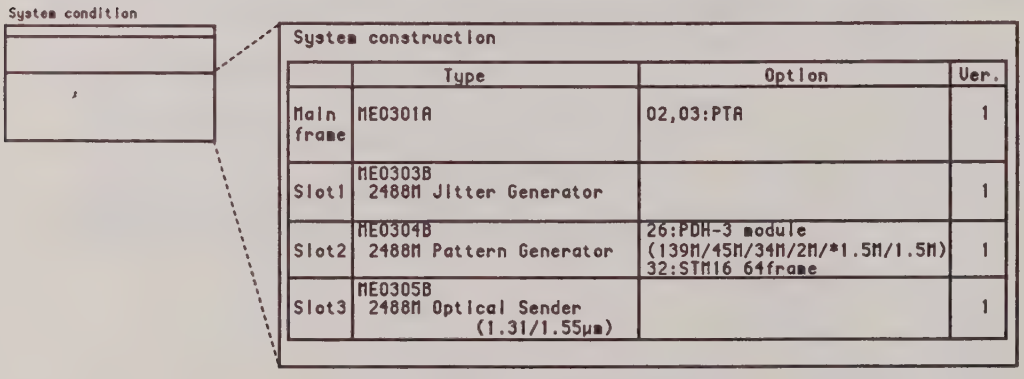


Fig. 5.16-4 Related screen

● SOH/POH preset data

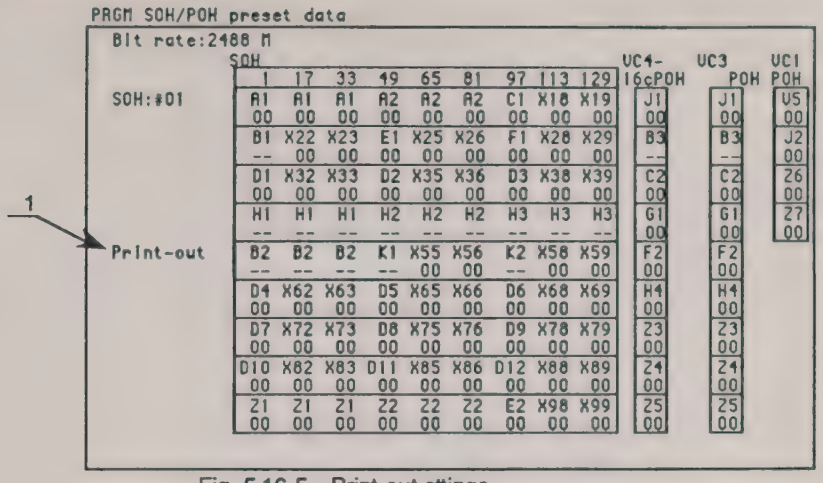


Fig. 5.16-5 Print-out sttings

Print-out Sets the data output control to the printer at 1.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The data set at Bit rate is output.
2. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Bit rate
3. SOH data : HEX data
4. POH data : HEX data

Format

Print contents depend on the Bit rate.

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|

SOH/POH preset data                          Bit rate:  52 M

SOH
 Column   1   2   3
 ------------------
 Row 1 | FF  FF  FF
 Row 2 | --  FF  FF
 Row 3 | FF  FF  FF
 Row 4 | --  --  --
 Row 5 | --  --  --
 Row 6 | FF  FF  FF
 Row 7 | FF  FF  FF
 Row 8 | FF  FF  FF
 Row 9 | FF  FF  FF

                VC3 POH          VC1 POH
                 Column   1       Column   1
                 ----------       ----------
                 Row 1 | FF       Row 1 | FF
                 Row 2 | --       Row 2 | FF
                 Row 3 | FF       Row 3 | FF
                 Row 4 | FF       Row 4 | FF
                 Row 5 | FF
                 Row 6 | FF
                 Row 7 | FF
                 Row 8 | FF
                 Row 9 | FF
```

Fig. 5.16-6 Print format (52 M)

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|

SOH/POH preset data                          Bit rate: 156 M

SOH
 Column   1   2   3   4   5   6   7   8   9
 ---------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | --  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | --  --  --  --  --  --  --  --  --
 Row 5 | --  --  --  --  FF  FF  --  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF

VC4 POH          VC3 POH          VC1 POH
 Column   1       Column   1       Column   1
 ----------       ----------       ----------
 Row 1 | FF       Row 1 | FF       Row 1 | FF
 Row 2 | --       Row 2 | --       Row 2 | FF
 Row 3 | FF       Row 3 | FF       Row 3 | FF
 Row 4 | FF       Row 4 | FF       Row 4 | FF
 Row 5 | FF       Row 5 | FF
 Row 6 | FF       Row 6 | FF
 Row 7 | FF       Row 7 | FF
 Row 8 | FF       Row 8 | FF
 Row 9 | FF       Row 9 | FF
```

Fig. 5.16-7 Print format (156 M)

```
1        10        20        30        40        50        60        70        80
|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|
SOH/POH preset data                    Bit rate: 622 M

SOH
 Column   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | --  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
 Row 5 | --  --  --  --  --  --  --  --  --  --  --  --  --  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

 Column  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
 Row 5 | FF  FF  FF  FF  FF  FF  --  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

VC4-4c POH      VC3 POH         VC1 POH
 Column   1      Column   1      Column   1
 ----------      ----------      ----------
 Row 1 | FF      Row 1 | FF      Row 1 | FF
 Row 2 | --      Row 2 | --      Row 2 | FF
 Row 3 | FF      Row 3 | FF      Row 3 | FF
 Row 4 | FF      Row 4 | FF      Row 4 | FF
 Row 5 | FF      Row 5 | FF
 Row 6 | FF      Row 6 | FF
 Row 7 | FF      Row 7 | FF
 Row 8 | FF      Row 8 | FF
 Row 9 | FF      Row 9 | FF
```

Fig. 5.16-8 Print format (622 M)

1 10 20 30 40 50 60 70 80

SOH/POH preset data Bit rate:2488 M

SOH

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	--	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	--	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	--	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

```
1         10        20        30        40        50        60        70        80
|---------|---------|---------|---------|---------|---------|---------|---------|

Column 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

Column 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

VC4-16c POH      VC3 POH          VC1 POH
 Column   1       Column   1       Column   1
 ----------       ----------       ----------
Row 1 | FF      Row 1 | FF      Row 1 | FF
Row 2 | --      Row 2 | --      Row 2 | FF
Row 3 | FF      Row 3 | FF      Row 3 | FF
Row 4 | FF      Row 4 | FF      Row 4 | FF
Row 5 | FF      Row 5 | FF
Row 6 | FF      Row 6 | FF
Row 7 | FF      Row 7 | FF
Row 8 | FF      Row 8 | FF
Row 9 | FF      Row 9 | FF
```

Fig. 5.16-9 Print format (2488 M)

● Payload data

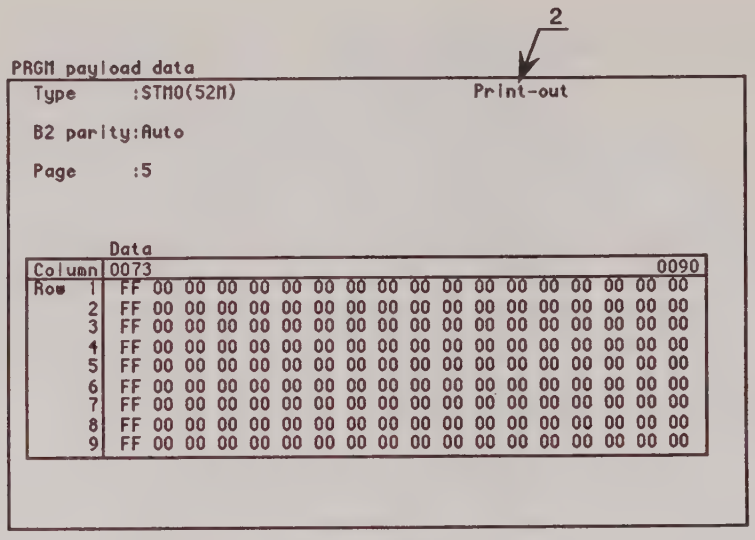


Fig. 5.16-10 Print-out settings

Print-out Sets the data output control to the printer at 2.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The data set at Type is output.
2. When "Printer error !! " error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Type : STM0 (52M)／STM1
3. Page : 1 ～ 15
4. Data : HEX data

Format

The number of print page depends on the Type.

STM0 (52M) : 1/ 5～ 5/ 5
STM1 : 1/15～15/15

```
1        10        20        30        40        50        60        70        80
|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|
PRGM payload data                    Type:STM1

Page :  1/ 15
 Column   1                                                                  18
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

Page :  2/ 15
 Column  19                                                                  36
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
                                        :
                                        : (Same as Page:3/15～13/15)
                                        :
Page : 14/ 15
 Column 235                                                                 252
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

Page : 15/ 15
 Column 253                                                                 270
 ---------------------------------------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
```

Fig. 5.16-11 Print format

● SOH 64-frame data

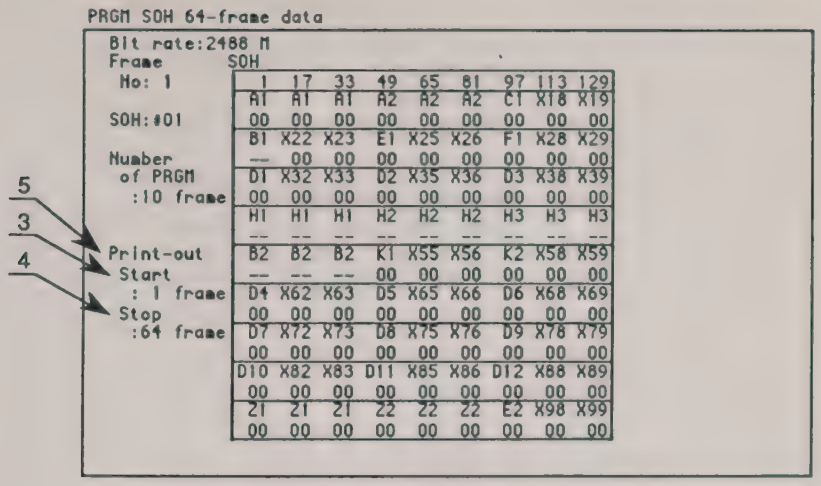


Fig. 5.16-12 Print-out settings

Start Sets the head frame No. of output data at 3.
The setting range is as follows:

[Setting range] 1 ~ 64 / step1

Stop Sets the end frame No. of output data at 4.
The setting range is as follows:

[Setting range] 1 ~ 64 / step 1

Note: Stop<Start cannot be set.

Print-out Sets the data output control to the printer at 5.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:
1. The data set at Bit rate is output.
2. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Bit rate
3. Frame No. : 1 ~ 64
4. SOH data : HEX data

Format

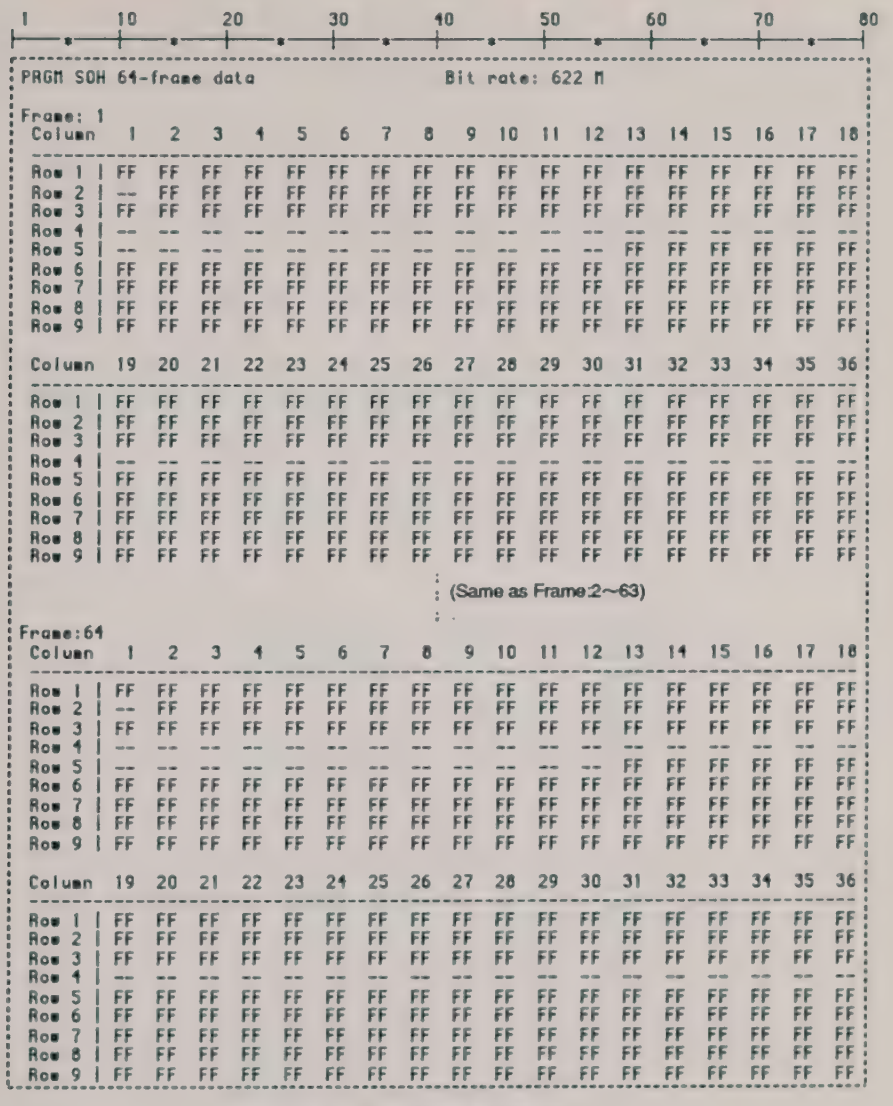
Print contents depend on the Bit rate.
The print start/end frames are subject to the settings of Start/Stop frames.

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|

PRGM SOH 64-frame data                    Bit rate:  52 M

Frame: 1
 Column   1   2   3
 ------------------
 Row 1 | FF  FF  FF
 Row 2 | --  FF  FF
 Row 3 | FF  FF  FF
 Row 4 | --  --  --
 Row 5 | --  FF  FF
 Row 6 | FF  FF  FF
 Row 7 | FF  FF  FF
 Row 8 | FF  FF  FF
 Row 9 | FF  FF  FF
          :
          : (Same as Frame:2~63)
          :
Frame:64
 Column   1   2   3
 ------------------
 Row 1 | FF  FF  FF
 Row 2 | --  FF  FF
 Row 3 | FF  FF  FF
 Row 4 | --  --  --
 Row 5 | --  FF  FF
 Row 6 | FF  FF  FF
 Row 7 | FF  FF  FF
 Row 8 | FF  FF  FF
 Row 9 | FF  FF  FF
```

Fig. 5.16-13 Print format (52 M)

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|

PRGM SOH 64-frame data                    Bit rate: 156 M

Frame: 1
 Column   1   2   3   4   5   6   7   8   9
 ----------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | --  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | --  --  --  --  --  --  --  --  --
 Row 5 | --  --  --  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF
                    :
                    : (Same as Frame:2~63)
                    :
Frame:64
 Column   1   2   3   4   5   6   7   8   9
 ----------------------------------------------
 Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 2 | --  FF  FF  FF  FF  FF  FF  FF  FF
 Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 4 | --  --  --  --  --  --  --  --  --
 Row 5 | --  --  --  FF  FF  FF  FF  FF  FF
 Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF
 Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF
```

Fig. 5.16-14 Print format (156 M)



PRGM SOH 64-frame data Bit rate: 622 M

Frame: 1

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	--	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

(Same as Frame:2~63)

Frame:64

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	--	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Fig. 5.16-15 Print format (622 M)

1 10 20 30 40 50 60 70 80

PRGM SOH 64-frame data Bit rate:2488 M

Frame: 1

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	--	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

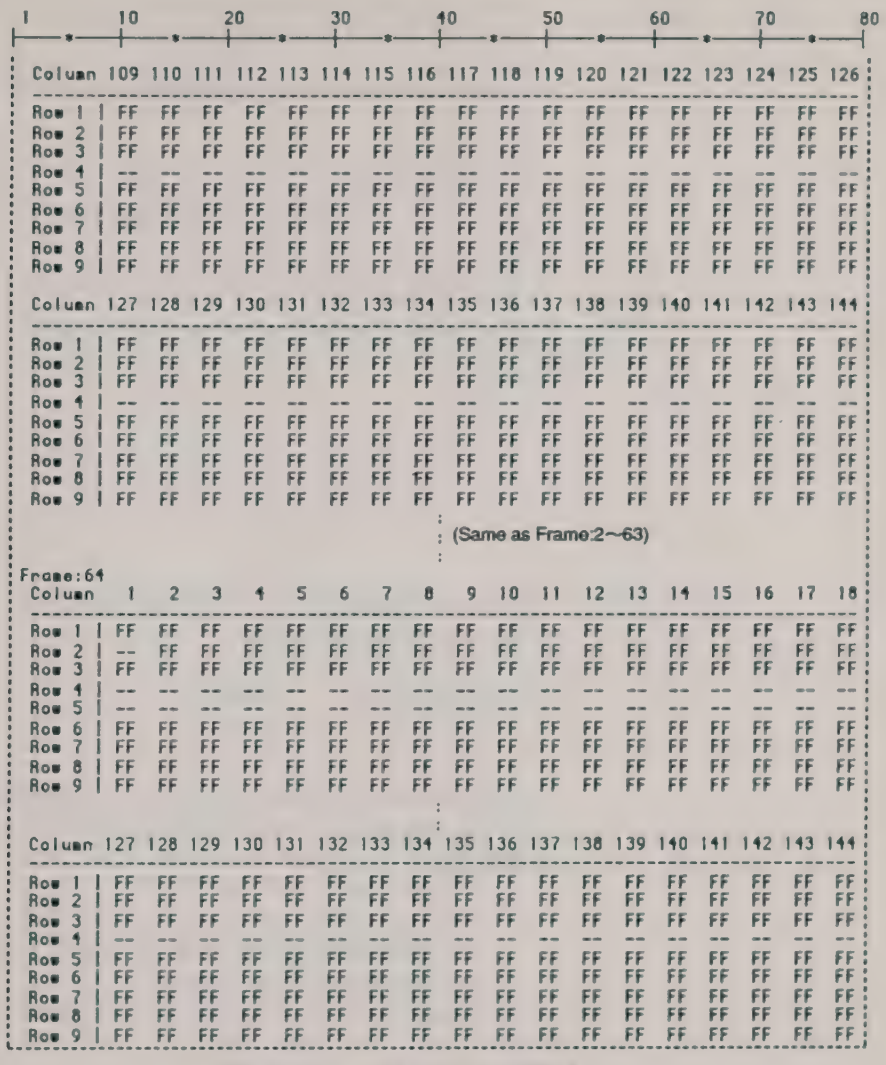
Column	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	--	--	--	--	--	--	--	--	--	--	--	--	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Column	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
Row 1	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 2	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 3	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Row 5	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 6	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 7	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 8	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Row 9	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF



```
1         10        20        30        40        50        60        70        80
|---------|---------|---------|---------|---------|---------|---------|---------|

Column 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF

Column 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
                                    :
                                    : (Same as Frame:2~63)
                                    :
Frame:64
Column   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | --  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
                                    :
                                    :
Column 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
-------------------------------------------------------------------------------
Row 1 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 2 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 3 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 4 | --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
Row 5 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 6 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 7 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 8 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
Row 9 | FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF  FF
```

Fig. 5.16-16 Print format (2488 M)

● POH 64-byte data

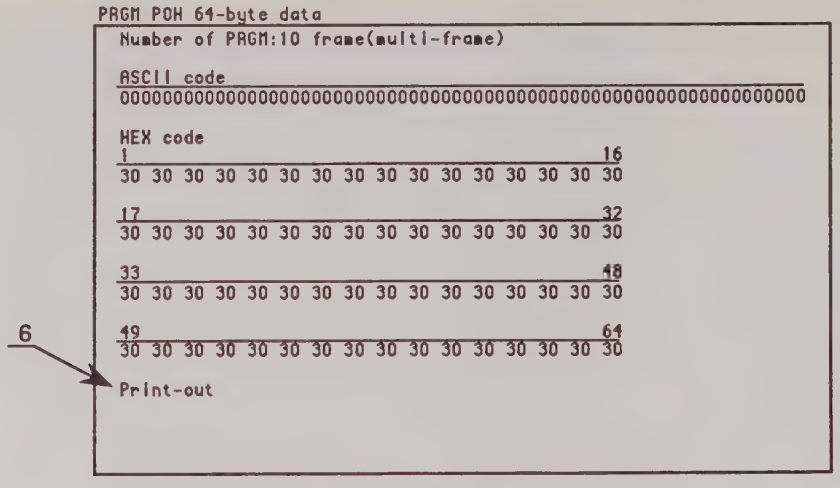


Fig. 5.16-17 Print-out settings

Print-out Sets the data output control to the printer at 6.
The setting range is as follows:

[Setting range] Execute
Cancel

Note: When "Printer error !! " error message is displayed, check the following conditions:

- The printer power must be ON.
- Are the printer connections correct (GP-IB2) ?
- The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. ASCII data
3. HEX data

Format

When the ASCII data is $00 ~ $1F or $7F ~ $FF, the print output is changed for '. ' ($2E).

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|

PRGM POH 64-byte data

 ASCII  ----*----*----*----*----*----*----*----*----*----*----*----*----*----
        0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmno

 HEX     1                                                              10
        ---------------------------------------------------------------------
        30  31  32  33  34  35  36  37  38  39  3A  3B  3C  3D  3E  3F
        17                                                             32
        ---------------------------------------------------------------------
        40  41  42  43  44  45  46  47  48  49  4A  4B  4C  4D  4E  4F
        33                                                             48
        ---------------------------------------------------------------------
        50  51  52  53  54  55  56  57  58  59  5A  5B  5C  5D  5E  5F
        49                                                             64
        ---------------------------------------------------------------------
        60  61  62  63  64  65  66  67  68  69  6A  6B  6C  6D  6E  6F
```

Fig. 5.16-18 Print format

● Pointer 64-frame data

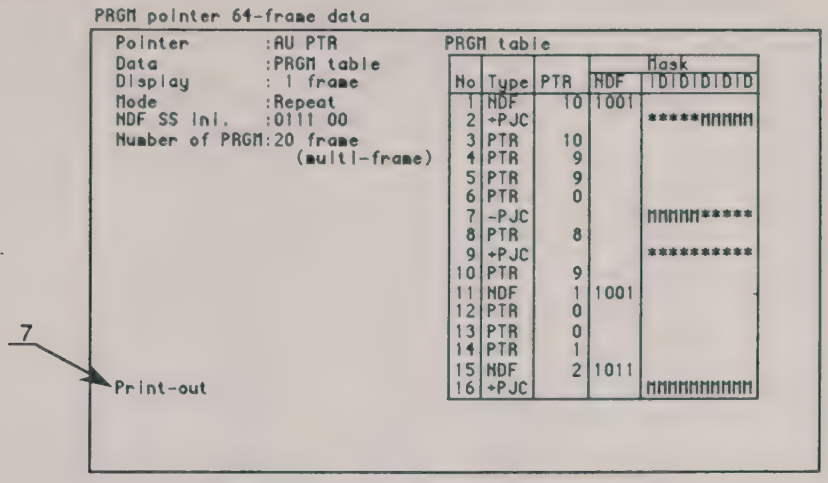


Fig. 5.16-19 Print-oout settings

Print-out Sets the data output control to the printer at 7.
The setting range is as follows:

[Setting range] Execute
Cancel

Note: When "Printer error !! " error message is displayed, check the following conditions:

- The printer power must be ON.
- Are the printer connections correct (GP-IB2) ?
- The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Pointer type
3. Mode, NDF/SS initial value, Frame No.
4. Data : PRGM table/Memory

Format

Print contents depend on the data.

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|
PRGM pointer 64-frame data

  Pointer:AU PTR    Mode:Repeat   NDF/SS ini.:0110 00   Number of PRGM:52 frame

  PRGM table
     No.  Type  PTR   NDF   IDIDIDIDID      No.  Type  PTR   NDF   IDIDIDIDID
    ------------------------------------  ------------------------------------
      1 | NDF   782  1001                   33 | NDF   782  1001
      2 | +PJC             *****MMMMM      34 | +PJC             *****MMMMM
      3 | NDF   782                        35 | NDF   782
      4 | -PJC             MMMMM*****      36 | -PJC             MMMMM*****
      5 | NDF   782  1001                   37 | NDF   782  1001
      6 | +PJC             *****MMMMM      38 | +PJC             *****MMMMM
      7 | NDF   782                        39 | NDF   782
      8 | -PJC             MMMMM*****      40 | -PJC             MMMMM*****
      9 | NDF   782  1001                   41 | NDF   782  1001
     10 | +PJC             *****MMMMM      42 | +PJC             *****MMMMM
     11 | NDF   782                        43 | NDF   782
     12 | -PJC             MMMMM*****      44 | -PJC             MMMMM*****
     13 | NDF   782  1001                   45 | NDF   782  1001
     14 | +PJC             *****MMMMM      46 | +PJC             *****MMMMM
     15 | NDF   782                        47 | NDF   782
     16 | -PJC             MMMMM*****      48 | -PJC             MMMMM*****
     17 | NDF   782  1001                   49 | NDF   782  1001
     18 | +PJC             *****MMMMM      50 | +PJC             *****MMMMM
     19 | NDF   782                        51 | NDF   782
     20 | -PJC             MMMMM*****      52 | -PJC             MMMMM*****
     21 | NDF   782  1001                   53 | NDF   782  1001
     22 | +PJC             *****MMMMM      54 | +PJC             *****MMMMM
     23 | NDF   782                        55 | NDF   782
     24 | -PJC             MMMMM*****      56 | -PJC             MMMMM*****
     25 | NDF   782  1001                   57 | NDF   782  1001
     26 | +PJC             *****MMMMM      58 | +PJC             *****MMMMM
     27 | NDF   782                        59 | NDF   782
     28 | -PJC             MMMMM*****      60 | -PJC             MMMMM*****
     29 | NDF   782  1001                   61 | NDF   782  1001
     30 | +PJC             *****MMMMM      62 | +PJC             *****MMMMM
     31 | NDF   782                        63 | NDF   782
     32 | -PJC             MMMMM*****      64 | -PJC             MMMMM*****
```

Fig. 5.16-20 Print format (PRGM table)

```
1        10        20        30        40        50        60        70        80
|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|
PRGM pointer 64-frame data

  Pointer:AU PTR    Mode:Repeat   NDF/SS ini.:0110 00   Number of PRGM:52 frame

  Memory
          ------Output-------  -Internal-          ------Output-------  -Internal-
     No.  NDF  SS IDIDIDIDID    J1  Type     No.  NDF  SS IDIDIDIDID    J1  Type
     ---------------------------------------  ---------------------------------------
      1 | 1001 10 1100001110   782  NDF      33 | 1001 10 1100001110   782  NDF
      2 | 0110 10 0110101110        +PJC     34 | 0110 10 0110101110        +PJC
      3 | 0110 10 0110101110     0           35 | 0110 10 0110101110     0
      4 | 0110 10 0000010101        -PJC     36 | 0110 10 0000010101        -PJC
      5 | 1001 10 1100001110   782  NDF      37 | 1001 10 1100001110   782  NDF
      6 | 0110 10 0110101110        +PJC     38 | 0110 10 0110101110        +PJC
      7 | 0110 10 0110101110     0           39 | 0110 10 0110101110     0
      8 | 0110 10 0000010101        -PJC     40 | 0110 10 0000010101        -PJC
      9 | 1001 10 1100001110   782  NDF      41 | 1001 10 1100001110   782  NDF
     10 | 0110 10 0110101110        +PJC     42 | 0110 10 0110101110        +PJC
     11 | 0110 10 0110101110     0           43 | 0110 10 0110101110     0
     12 | 0110 10 0000010101        -PJC     44 | 0110 10 0000010101        -PJC
     13 | 1001 10 1100001110   782  NDF      45 | 1001 10 1100001110   782  NDF
     14 | 0110 10 0110101110        +PJC     46 | 0110 10 0110101110        +PJC
     15 | 0110 10 0110101110     0           47 | 0110 10 0110101110     0
     16 | 0110 10 0000010101        -PJC     48 | 0110 10 0000010101        -PJC
     17 | 1001 10 1100001110   782  NDF      49 | 1001 10 1100001110   782  NDF
     18 | 0110 10 0110101110        +PJC     50 | 0110 10 0110101110        +PJC
     19 | 0110 10 0110101110     0           51 | 0110 10 0110101110     0
     20 | 0110 10 0000010101        -PJC     52 | 0110 10 0000010101        -PJC
     21 | 1001 10 1100001110   782  NDF      53 |
     22 | 0110 10 0110101110        +PJC     54 |
     23 | 0110 10 0110101110     0           55 |
     24 | 0110 10 0000010101        -PJC     56 |
     25 | 1001 10 1100001110   782  NDF      57 |
     26 | 0110 10 0110101110        +PJC     58 |
     27 | 0110 10 0110101110     0           59 |
     28 | 0110 10 0000010101        -PJC     60 |
     29 | 1001 10 1100001110   782  NDF      61 |
     30 | 0110 10 0110101110        +PJC     62 |
     31 | 0110 10 0110101110     0           63 |
     32 | 0110 10 0000010101        -PJC     64 |
```

Fig. 5.16-21 Print format (Memory)

● Frame data

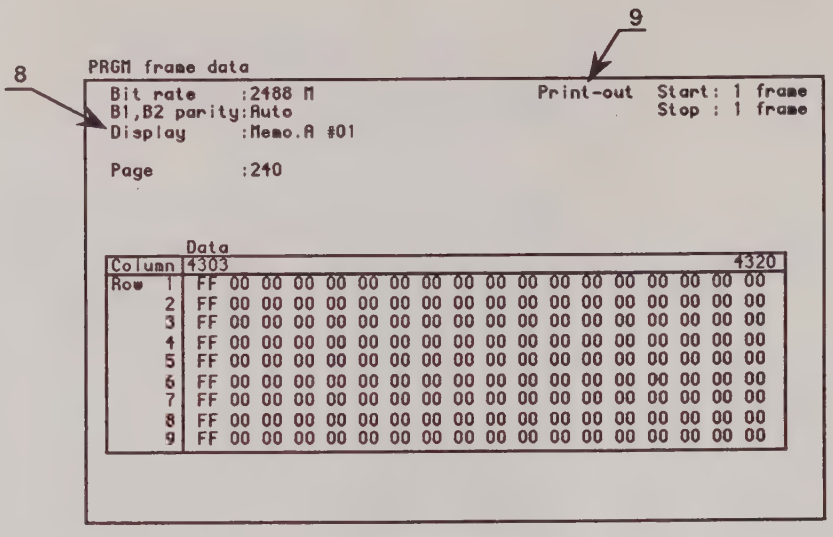


Fig. 5.16-22 Display settings

Display Sets the output memory type and the frame No. at 8.
The setting range is as follows:

[Setting range] Memo. A : 1 ~ 32 / step 1
Memo. B : 1 ~ 32 / step1

Note: Print-out Start and Stop are set the same value as the frame No.

Print-out Sets the data output control to the printer at 9.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The settings can be performed when the Type of generated pattern is PRGM frame data. (see section 5.9)
2. Only the displayed frame can be output.
3. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Bit rate
3. Print target memory : A/B
4. Frame No.
5. Page : 1 ~ 240
6. Data : HEX data

Format

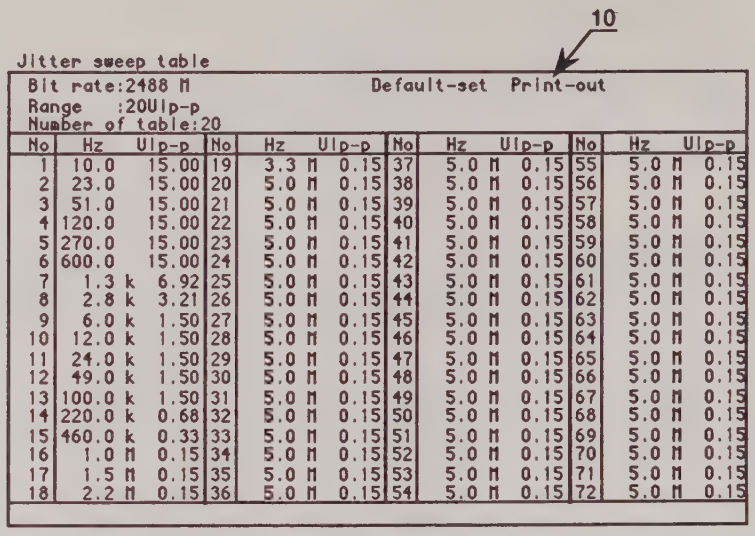
The number of print page depends on the Bit rate.

52 M : 1/ 5 ~ 5/ 5
156 M : 1/ 15 ~ 15/ 15
622 M : 1/ 60 ~ 60/ 60
2488 M : 1/240 ~ 240/240

```
1         10        20        30        40        50        60        70        80
|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|

PRGM frame data                          Bit rate:2488 M     Memory:A

Frame: 1
Page :  1/240
 Column   1                                                              18
 ------------------------------------------------------------------------
 Row 1 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 2 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 3 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 4 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 5 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 6 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 7 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 8 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 9 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
                                    :
                                    : (Same as Page:2/240~239/240)
                                    :
Page :240/240
 Column4303                                                          4320
 ------------------------------------------------------------------------
 Row 1 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 2 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 3 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 4 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 5 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 6 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 7 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 8 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 Row 9 | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Fig. 5.16-23 Print format

● Jitter sweep table



No	Hz	UIp-p	No	Hz	UIp-p	No	Hz	UIp-p	No	Hz	UIp-p
1	10.0	15.00	19	3.3 M	0.15	37	5.0 M	0.15	55	5.0 M	0.15
2	23.0	15.00	20	5.0 M	0.15	38	5.0 M	0.15	56	5.0 M	0.15
3	51.0	15.00	21	5.0 M	0.15	39	5.0 M	0.15	57	5.0 M	0.15
4	120.0	15.00	22	5.0 M	0.15	40	5.0 M	0.15	58	5.0 M	0.15
5	270.0	15.00	23	5.0 M	0.15	41	5.0 M	0.15	59	5.0 M	0.15
6	600.0	15.00	24	5.0 M	0.15	42	5.0 M	0.15	60	5.0 M	0.15
7	1.3 k	6.92	25	5.0 M	0.15	43	5.0 M	0.15	61	5.0 M	0.15
8	2.8 k	3.21	26	5.0 M	0.15	44	5.0 M	0.15	62	5.0 M	0.15
9	6.0 k	1.50	27	5.0 M	0.15	45	5.0 M	0.15	63	5.0 M	0.15
10	12.0 k	1.50	28	5.0 M	0.15	46	5.0 M	0.15	64	5.0 M	0.15
11	24.0 k	1.50	29	5.0 M	0.15	47	5.0 M	0.15	65	5.0 M	0.15
12	49.0 k	1.50	30	5.0 M	0.15	48	5.0 M	0.15	66	5.0 M	0.15
13	100.0 k	1.50	31	5.0 M	0.15	49	5.0 M	0.15	67	5.0 M	0.15
14	220.0 k	0.68	32	5.0 M	0.15	50	5.0 M	0.15	68	5.0 M	0.15
15	460.0 k	0.33	33	5.0 M	0.15	51	5.0 M	0.15	69	5.0 M	0.15
16	1.0 M	0.15	34	5.0 M	0.15	52	5.0 M	0.15	70	5.0 M	0.15
17	1.5 M	0.15	35	5.0 M	0.15	53	5.0 M	0.15	71	5.0 M	0.15
18	2.2 M	0.15	36	5.0 M	0.15	54	5.0 M	0.15	72	5.0 M	0.15

Fig. 5.16-24 Print-out settings

Print-out Sets the data output control to the printer at 10.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The settings can be performed when ME0303A/B unit is mounted.
2. Only the displayed frame can be output.
3. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

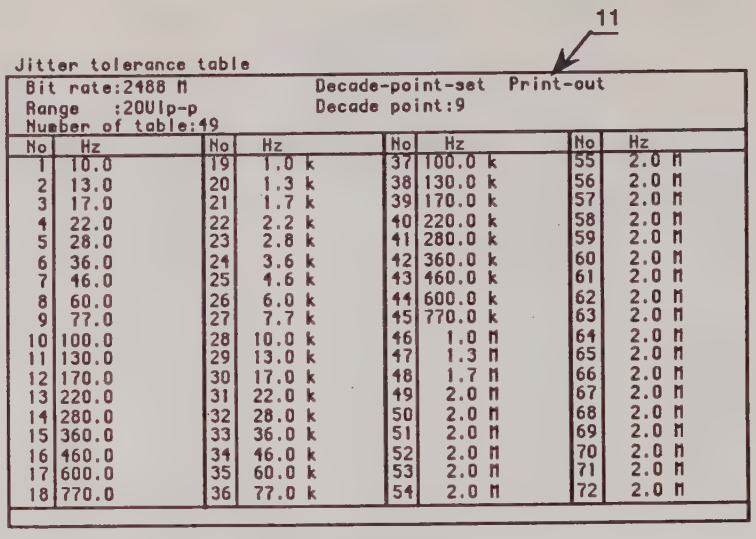
1. Data name
2. Bit rate
3. Range
4. Number of table
5. data : Moduration frequency, Amplitude

Format

```
1        10        20        30        40        50        60        70        80
|---*---|---*---|---*---|---*---|---*---|---*---|---*---|---*---|
Jitter sweep table
  Bit rate        :2488 M
  Range           :20Ulp-p
  Number of table:20

No    Hz    Ulp-p   No    Hz    Ulp-p   No    Hz    Ulp-p   No    Hz    Ulp-p
-----------------------------------------------------------------------------
 1| 10.0     15.00  19|  3.3 M   0.15  37|  5.0 M   0.15  55|  5.0 M   0.15
 2| 23.0     15.00  20|  5.0 M   0.15  38|  5.0 M   0.15  56|  5.0 M   0.15
 3| 51.0     15.00  21|  5.0 M   0.15  39|  5.0 M   0.15  57|  5.0 M   0.15
 4|120.0     15.00  22|  5.0 M   0.15  40|  5.0 M   0.15  58|  5.0 M   0.15
 5|270.0     15.00  23|  5.0 M   0.15  41|  5.0 M   0.15  59|  5.0 M   0.15
 6|600.0     15.00  24|  5.0 M   0.15  42|  5.0 M   0.15  60|  5.0 M   0.15
 7|  1.3 k    6.92  25|  5.0 M   0.15  43|  5.0 M   0.15  61|  5.0 M   0.15
 8|  2.8 k    3.21  26|  5.0 M   0.15  44|  5.0 M   0.15  62|  5.0 M   0.15
 9|  6.0 k    1.50  27|  5.0 M   0.15  45|  5.0 M   0.15  63|  5.0 M   0.15
10| 12.0 k    1.50  28|  5.0 M   0.15  46|  5.0 M   0.15  64|  5.0 M   0.15
11| 24.0 k    1.50  29|  5.0 M   0.15  47|  5.0 M   0.15  65|  5.0 M   0.15
12| 49.0 k    1.50  30|  5.0 M   0.15  48|  5.0 M   0.15  66|  5.0 M   0.15
13|100.0 k    1.50  31|  5.0 M   0.15  49|  5.0 M   0.15  67|  5.0 M   0.15
14|220.0 k    0.68  32|  5.0 M   0.15  50|  5.0 M   0.15  68|  5.0 M   0.15
15|460.0 k    0.33  33|  5.0 M   0.15  51|  5.0 M   0.15  69|  5.0 M   0.15
16|  1.0 M    0.15  34|  5.0 M   0.15  52|  5.0 M   0.15  70|  5.0 M   0.15
17|  1.5 M    0.15  35|  5.0 M   0.15  53|  5.0 M   0.15  71|  5.0 M   0.15
18|  2.2 M    0.15  36|  5.0 M   0.15  54|  5.0 M   0.15  72|  5.0 M   0.15
```

Fig. 5.16-25 Print format

● Jitter tolerance table



No	Hz	No	Hz	No	Hz	No	Hz
1	10.0	19	1.0 k	37	100.0 k	55	2.0 M
2	13.0	20	1.3 k	38	130.0 k	56	2.0 M
3	17.0	21	1.7 k	39	170.0 k	57	2.0 M
4	22.0	22	2.2 k	40	220.0 k	58	2.0 M
5	28.0	23	2.8 k	41	280.0 k	59	2.0 M
6	36.0	24	3.6 k	42	360.0 k	60	2.0 M
7	46.0	25	4.6 k	43	460.0 k	61	2.0 M
8	60.0	26	6.0 k	44	600.0 k	62	2.0 M
9	77.0	27	7.7 k	45	770.0 k	63	2.0 M
10	100.0	28	10.0 k	46	1.0 M	64	2.0 M
11	130.0	29	13.0 k	47	1.3 M	65	2.0 M
12	170.0	30	17.0 k	48	1.7 M	66	2.0 M
13	220.0	31	22.0 k	49	2.0 M	67	2.0 M
14	280.0	32	28.0 k	50	2.0 M	68	2.0 M
15	360.0	33	36.0 k	51	2.0 M	69	2.0 M
16	460.0	34	46.0 k	52	2.0 M	70	2.0 M
17	600.0	35	60.0 k	53	2.0 M	71	2.0 M
18	770.0	36	77.0 k	54	2.0 M	72	2.0 M

Fig. 5.16-26 Print-out settings

Print-out Sets the data output control to the printer at 11.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The settings can be performed when ME0303A/B unit is mounted.
2. Only the displayed frame can be output.
3. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. Bit rate
3. Range
4. Number of table
5. Decade point
6. Data : Moduration frequency

Format

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|
```

Jitter tolerance table
Bit rate :2488 M
Range :20UIp-p
Number of table:49 Decade point:9

No	Hz	No	Hz	No	Hz	No	Hz
1	10.0	19	1.0 k	37	100.0 k	55	2.0 M
2	13.0	20	1.3 k	38	130.0 k	56	2.0 M
3	17.0	21	1.7 k	39	170.0 k	57	2.0 M
4	22.0	22	2.2 k	40	220.0 k	58	2.0 M
5	28.0	23	2.8 k	41	280.0 k	59	2.0 M
6	36.0	24	3.6 k	42	360.0 k	60	2.0 M
7	46.0	25	4.6 k	43	460.0 k	61	2.0 M
8	60.0	26	6.0 k	44	600.0 k	62	2.0 M
9	77.0	27	7.7 k	45	770.0 k	63	2.0 M
10	100.0	28	10.0 k	46	1.0 M	64	2.0 M
11	130.0	29	13.0 k	47	1.3 M	65	2.0 M
12	170.0	30	17.0 k	48	1.7 M	66	2.0 M
13	220.0	31	22.0 k	49	2.0 M	67	2.0 M
14	280.0	32	28.0 k	50	2.0 M	68	2.0 M
15	360.0	33	36.0 k	51	2.0 M	69	2.0 M
16	460.0	34	46.0 k	52	2.0 M	70	2.0 M
17	600.0	35	60.0 k	53	2.0 M	71	2.0 M
18	770.0	36	77.0 k	54	2.0 M	72	2.0 M

Fig. 5.16-27 Print format

● CRC-7 data

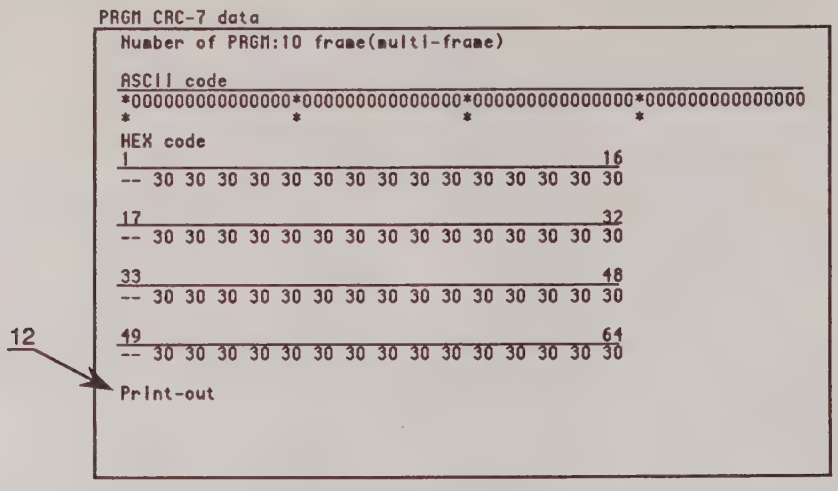


Fig. 5.16-28 Print-out settings

Print-out Sets the data output control to the printer at 12.
The setting range is as follows:

[Setting range] Execute
Cancel

Note: When "Printer error !! " error message is displayed, check the following conditions:

- The printer power must be ON.
- Are the printer connections correct (GP-IB2) ?
- The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name
2. ASCII data
3. HEX data

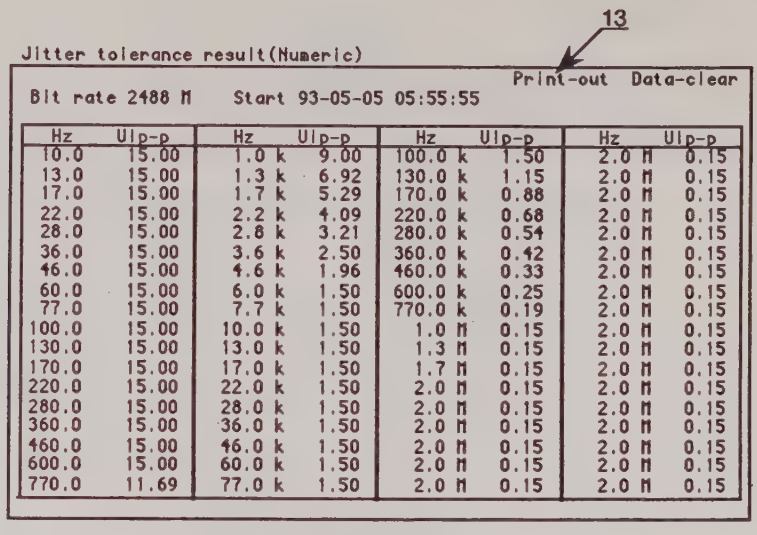
Format

When the ASCII data is $00 ~ $1F or $7F ~ $FF, the print output is changed for '. ' ($2E).

```
1        10        20        30        40        50        60        70        80
|----*----|----*----|----*----|----*----|----*----|----*----|----*----|----*----|
PRGM CRC-7 data

  ASCII  ----*----*----*----*----*----*----*----*----*----*----*----*----*----
         *123456789:;<=>?*ABCDEFGHIJKLMNO*QRSTUUWXYZ**¥]^_`abcdefghijklmno

  HEX     1                                                              16
         ---------------------------------------------------------------------
         --  31  32  33  34  35  36  37  38  39  3A  3B  3C  3D  3E  3F

         17                                                             32
         ---------------------------------------------------------------------
         --  41  42  43  44  45  46  47  48  49  4A  4B  4C  4D  4E  4F

         33                                                             48
         ---------------------------------------------------------------------
         --  51  52  53  54  55  56  57  58  59  5A  5B  5C  5D  5E  5F

         49                                                             64
         ---------------------------------------------------------------------
         --  61  62  63  64  65  66  67  68  69  6A  6B  6C  6D  6E  6F
```

Fig. 5.16-29 Print format

● Jitter tolerance result



Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p	Hz	Ulp-p
10.0	15.00	1.0 k	9.00	100.0 k	1.50	2.0 M	0.15
13.0	15.00	1.3 k	6.92	130.0 k	1.15	2.0 M	0.15
17.0	15.00	1.7 k	5.29	170.0 k	0.88	2.0 M	0.15
22.0	15.00	2.2 k	4.09	220.0 k	0.68	2.0 M	0.15
28.0	15.00	2.8 k	3.21	280.0 k	0.54	2.0 M	0.15
36.0	15.00	3.6 k	2.50	360.0 k	0.42	2.0 M	0.15
46.0	15.00	4.6 k	1.96	460.0 k	0.33	2.0 M	0.15
60.0	15.00	6.0 k	1.50	600.0 k	0.25	2.0 M	0.15
77.0	15.00	7.7 k	1.50	770.0 k	0.19	2.0 M	0.15
100.0	15.00	10.0 k	1.50	1.0 M	0.15	2.0 M	0.15
130.0	15.00	13.0 k	1.50	1.3 M	0.15	2.0 M	0.15
170.0	15.00	17.0 k	1.50	1.7 M	0.15	2.0 M	0.15
220.0	15.00	22.0 k	1.50	2.0 M	0.15	2.0 M	0.15
280.0	15.00	28.0 k	1.50	2.0 M	0.15	2.0 M	0.15
360.0	15.00	36.0 k	1.50	2.0 M	0.15	2.0 M	0.15
460.0	15.00	46.0 k	1.50	2.0 M	0.15	2.0 M	0.15
600.0	15.00	60.0 k	1.50	2.0 M	0.15	2.0 M	0.15
770.0	11.69	77.0 k	1.50	2.0 M	0.15	2.0 M	0.15

Fig. 5.16-30 Print-out settings

Print-out Sets the data output control to the printer at 13.
The setting range is as follows:

[Setting range] Execute
Cancel

Note:

1. The settings can be performed when the measurement result data is existed.
2. When "Printer error !!" error message is displayed, check the following conditions:
   - The printer power must be ON.
   - Are the printer connections correct (GP-IB2) ?
   - The same value must be set at the Printer address printer settings and the external printer address.

■ Print format

Print contents

The print contents are as follows:

1. Data name , Measurement start time
2. Bit rate, Type
3. Signal format
   - Unit/Format
   - Route1
   - Route2
   - Signalling
4. Jitter measurement condition
   - Range
   - Interval
5. Data : Moduration frequency, Maximum amplitude data

Format

```
1        10        20        30        40        50        60        70        80
|---*----|---*----|---*----|---*----|---*----|---*----|---*----|---*----|
Jitter tolerance result                    Start:93-06-09 10:10:10

  Bit rate/Type:2488 M   SDH-Internal
  Unit/Format  :VC3          *01 Bulk
  Route1       :AU4          *01
  Route2       :TUG3         *01
  Signalling   :             *01

  Range        :20Ulp-p
  Interval     : 0.5 sec.

  Hz     Ulp-p      Hz     Ulp-p      Hz     Ulp-p      Hz     Ulp-p
-------------------------------------------------------------------
 10.0    15.00     1.0 k    9.00    100.0 k   1.50     2.0 M    0.15
 13.0    15.00     1.3 k    6.92    130.0 k   1.15     2.0 M    0.15
 17.0    15.00     1.7 k    5.29    170.0 k   0.88     2.0 M    0.15
 22.0    15.00     2.2 k    4.09    220.0 k   0.68     2.0 M    0.15
 28.0    15.00     2.8 k    3.21    280.0 k   0.54     2.0 M    0.15
 36.0    15.00     3.6 k    2.50    360.0 k   0.42     2.0 M    0.15
 46.0    15.00     4.6 k    1.96    460.0 k   0.33     2.0 M    0.15
 60.0    15.00     6.0 k    1.50    600.0 k   0.25     2.0 M    0.15
 77.0    15.00     7.7 k    1.50    770.0 k   0.19     2.0 M    0.15
100.0    15.00    10.0 k    1.50      1.0 M   0.15     2.0 M    0.15
130.0    15.00    13.0 k    1.50      1.3 M   0.15     2.0 M    0.15
170.0    15.00    17.0 k    1.50      1.7 M   0.15     2.0 M    0.15
220.0    15.00    22.0 k    1.50      2.0 M   0.15     2.0 M    0.15
280.0    15.00    28.0 k    1.50      2.0 M   0.15     2.0 M    0.15
360.0    15.00    36.0 k    1.50      2.0 M   0.15     2.0 M    0.15
460.0    15.00    46.0 k    1.50      2.0 M   0.15     2.0 M    0.15
600.0    15.00    60.0 k    1.50      2.0 M   0.15     2.0 M    0.15
770.0    11.69    77.0 k    1.50      2.0M    0.15     2.0 M    0.15
```

Fig. 5.16-31 Print format

The underlined part indicates the maximum No. of characters for that part.

Note:

1. The print items are restricted according to the measurement conditions.
2. When an item is not in line unit, that lline is not displayed.
3. The modulation frequency and amplitude of no data No. is displayed blanck.

● Hard copy

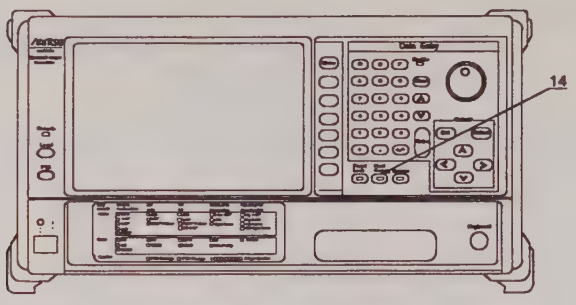


Fig. 5.16-32 Hard copy settings

Hard copy

Controls the execution of screen copy (Dump) by using the Hard copy key in the front panel at 14.
The setting range is as follows:

[Setting range] Hard copy OFF
Hard copy ON

Outputs the displayed contents on the EL screen to the printer.
At the Hard copy ON, the Hard copy key LED lights on and the screen becomes the Hold-state.
In addition, the Hard copy ON continues after finishing copy.
At the Hard copy OFF, the Hard copy key LED goes off and outputting is interrupted and the screen Hold-state is also relesed.

Note:

1. At printer error occurrence, the error message is not displayed.
2. When the Panel lock is ON during executing the Hard copy or when the Remote status is performed, the Hard copy operation is forcibly stopped.

■ Print format

Print contents

The print contents are as follows:

- All items desplayed on EL screen

Format

Depends on the printer type.

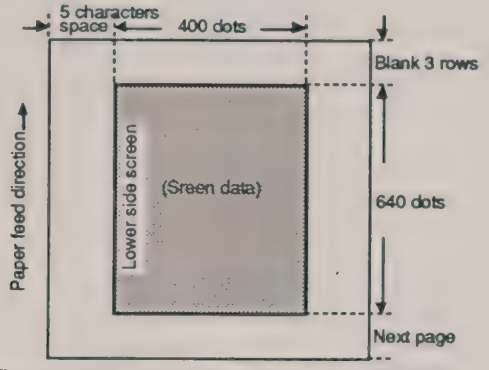


Fig. 5.16-33 Print format (Type 0 : EPSON)

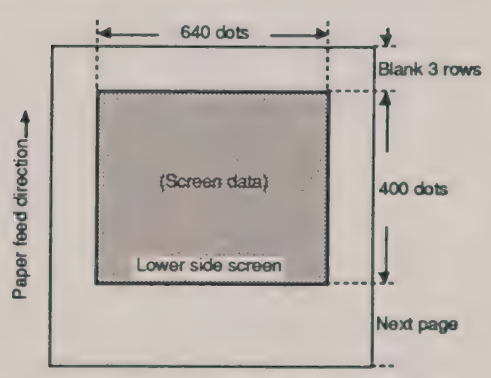


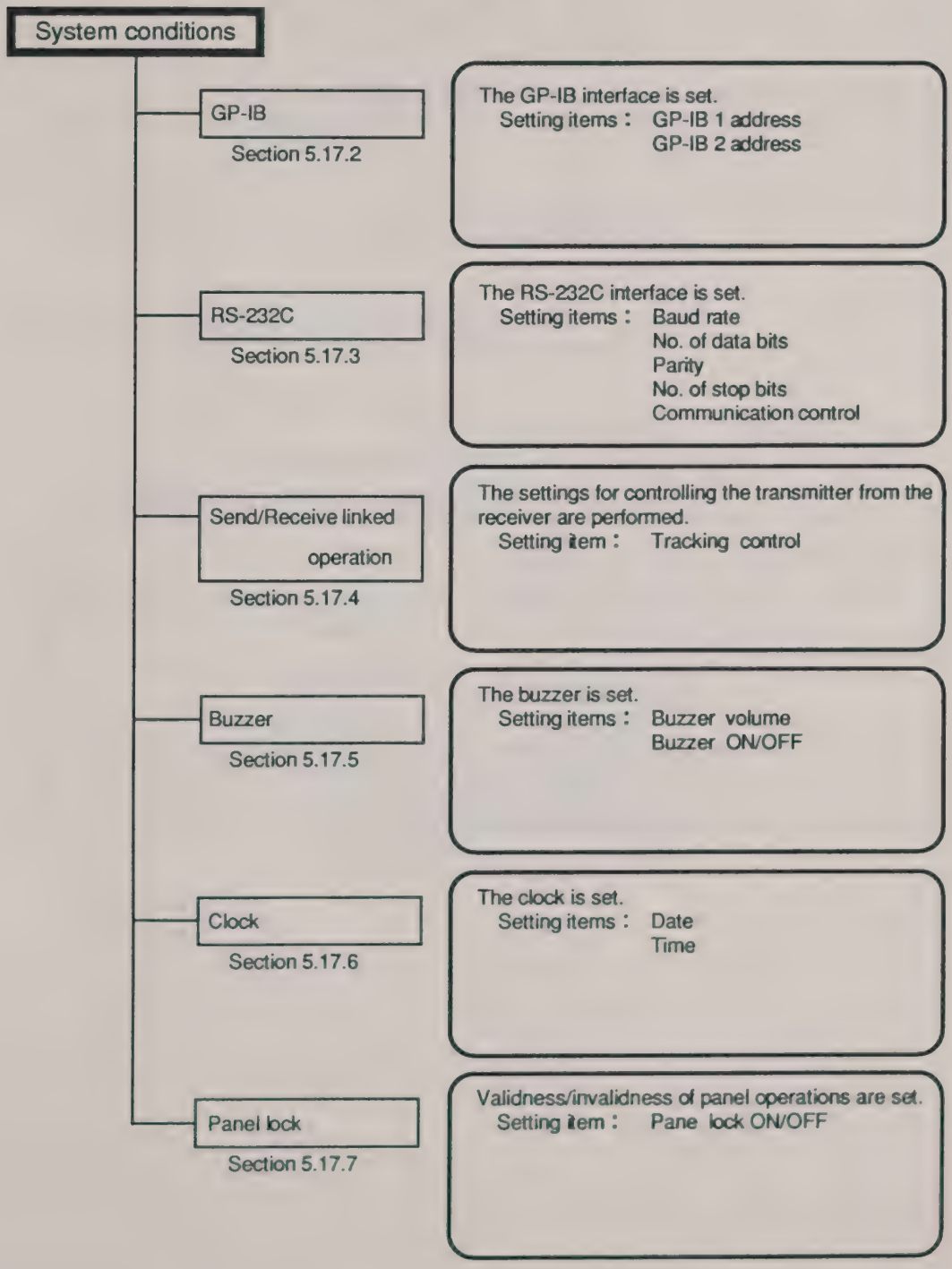
Fig. 5.16-34 Print format (Type 1 : HP)

Note: Printed out by rotaring 90 degree at rigth at Type 0 : EPSON.

5. 17 Setting System conditions

5. 17. 1 List of functions

The settings related to the whole of transmitter are performed.
The system conditions setting functions are listed below.



5. 17. 2 Setting GP-IB

The GP-IB interface is set here.

[Setting items] The following items can be set.

Address
- GPIB 1
- GPIB 2

[Operation screen] The settings are performed on the following screen.

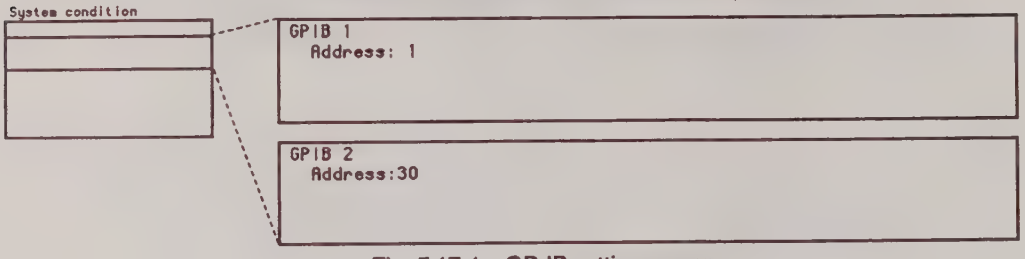
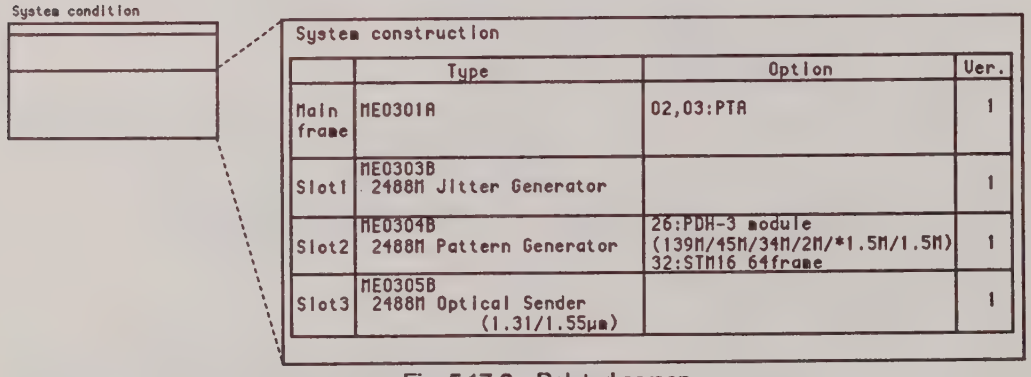


Fig. 5.17-1 GP-IB setting screen

[Related items] The following item is affected.

- Presence/absence of electrical option-01

In addition, the option status can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	02,03:PTA	1
Slot1	ME0303B 2488M Jitter Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.17-2 Related screen

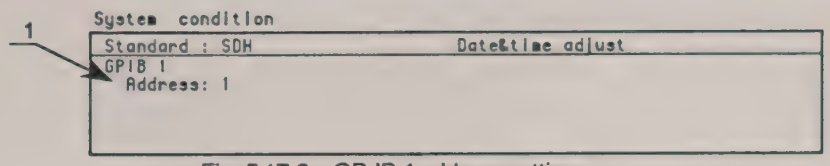


Fig. 5.17-3 GP-IB 1 address settings

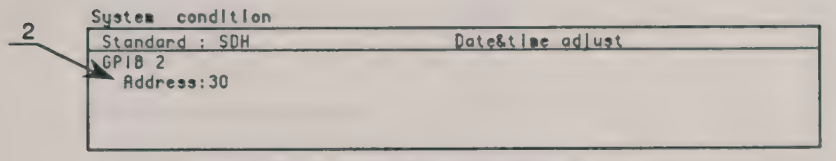


Fig. 5.17-4 GP-IB 2 address settings

GP-IB1 Address

Sets the GP-IB1 address at 1.
The setting range is as follows:

[Setting range] 1 ~ 30 / step 1

Note: This cannot be set when electrical option-01 RS-232C interface is mounted.

GP-IB2 Address

Sets the GP-IB2 address for printer outputting at 2.
The setting range is as follows:

[Setting range] 1 ~ 30 / step 1

Note: When GP-IB2 Address 2 is set to the same value as the Printer address, the Printer address value is changed.

5. 17. 3 Setting RS-232C (Option)

The RS-232C interface is set here.

[Setting items] The following items can be set.

Communication mode
- Baud rate
- No. of data bits
- Parity
- No. of stop bits
- Communication control

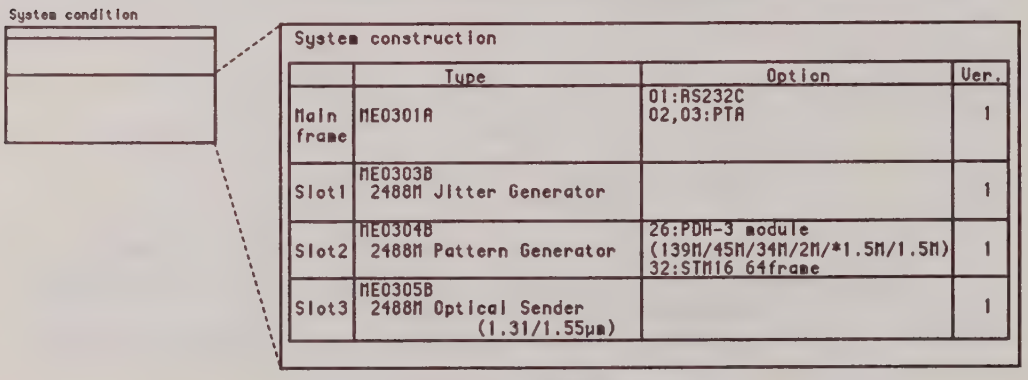
[Operation screen] The settings can be performed on the following screen.

Fig. 5.17-5 RS-232C setting screen

[Related items] The following item is affected.

- Presence/absence of electrical option-01.

In addition, the option status can be confirmed at the following screen.



	Type	Option	Ver.
Main frame	ME0301A	01:RS232C 02,03:PTA	1
Slot1	ME0303B 2488M Jitter Generator		1
Slot2	ME0304B 2488M Pattern Generator	26:PDH-3 module (139M/45M/34M/2M/*1.5M/1.5M) 32:STM16 64frame	1
Slot3	ME0305B 2488M Optical Sender (1.31/1.55μm)		1

Fig. 5.17-6 Related screen

Note:
1. This can be set when electrical option-01 is installed in ME0301A main frame.
2. The communication method is full duplex.
3. For details, refer to RS-232C interface operation manual.

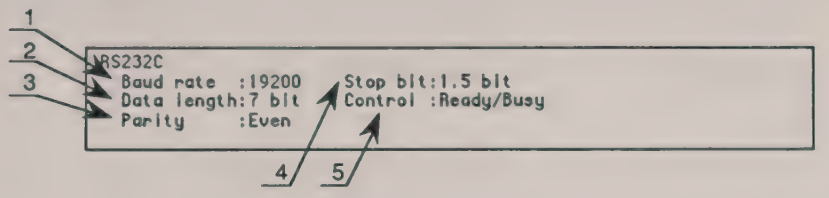


Fig. 5.17-7 RS-232C settings

Baud rate Sets the transfer speed at 1.
The setting range is as follows:

[Setting range] 300
600
1200
2400
4800
9600
19200

Data length Sets the number of data bits at 2.
The setting range is as follows:

[Setting range] 7 bit
8 bit

Parity Sets the parity at 3.
The setting range is as follows:

[Setting range] Non : No parity
Odd : Odd parity
Even : Even parity

Stop bit Sets the stop bits at 4.
The setting range is as follows:

[Setting range] 1 bit
1.5 bit
2 bit

Control Sets the communication control method at 5.
The setting range is as follows:

[Setting range] X-ON/X-OFF
Ready/Busy

5. 17. 4 Setting send/receive linked operation

The settings for controlling the transmitter from the receiver are performed here.

[Setting items] The following item can be set.

- Control

[Operation screen] The settings can be performed on the following screen.

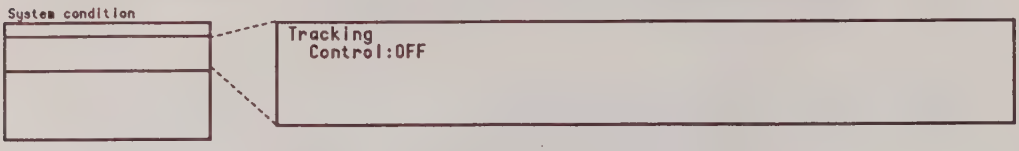


Fig. 5.17-8 Send/receive linked operation setting screen

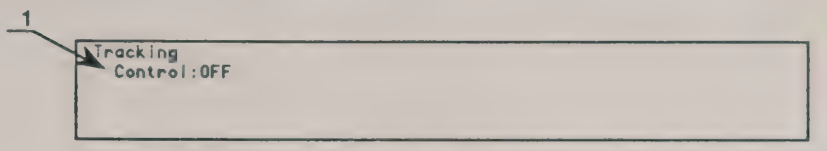


Fig. 5.17-9 Tracking settings

Control Sets the send/receive linked switch at 1.
The setting range is as follows:

[Setting range] OFF
ON

Note: At Tracking ON, there are the following restrictions.

- The following generated patterns cannot be selected:
  - SDH-Through
  - SDH-Insert
  - PRGM frame data
- The following test patterns cannot be selected:
  - SOH 64-frame
  - POH 64-byte
  - PRGM CRC-7

5. 17. 5 Setting Buzzer

The volume of the transmitter buzzer is set here.

[Setting items] The following items can be set.

- Buzzer volume — Entry (Operation error)
  Alarm (Alarm monitor)
- Buzzer ON/OFF

[Operation screen] The settings can be performed on the following screen.

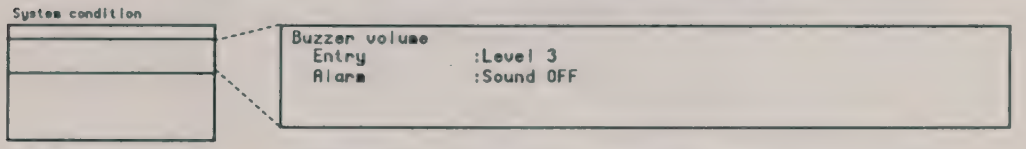


Fig. 5.17-10 Buzzer volume setting screen

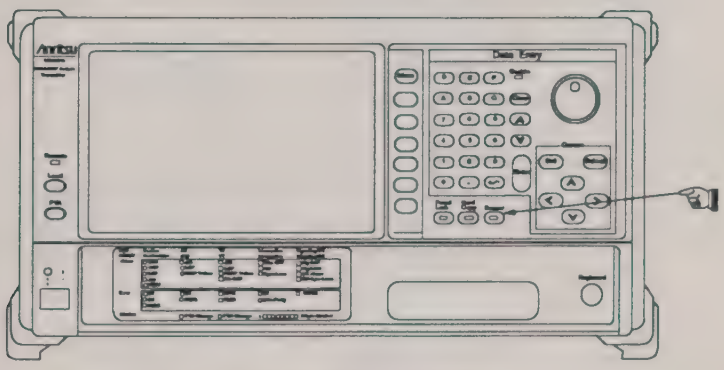


Fig. 5.17-11 Buzzer ON/OFF settings

Note: The buzzer does not sound when the front-panel Buzzer key LED is OFF.

● Buzzer ON／OFF

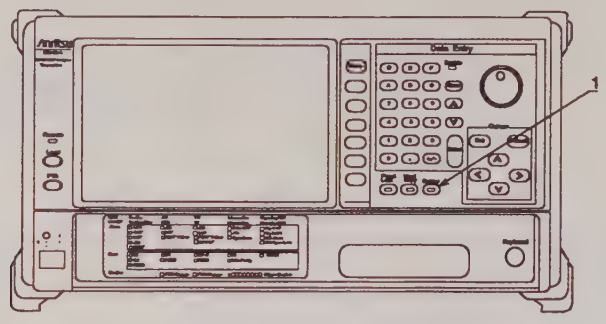


Fig. 5.17-12 ON/OFF settings

Buzzer Sets the buzzer execution status by using the front-panel Buzzer key at 1.
The setting range is as follows:

[Setting range] Buzzer OFF
Buzzer ON

Note: At OFF, the Buzzer key LED is off and the buzzer does not for any items.

● Buzzer volume

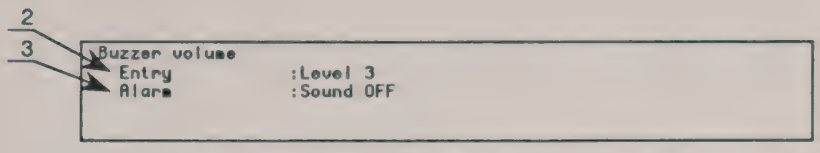


Fig. 5.17-13 Volume settings

Entry Sets the buzzer volume at occurrence of operation error at 2.
The setting range is as follows:

[Setting range]
Sound OFF
Level 1 : small level
Level 2
Level 3
Level 4 : large level

Note:
1. At Sound OFF, the buzzer does not sound.

Alarm Sets the buzzer volume at detecting the alarm at 3.
The setting range is as follows:

[Setting range]
Sound OFF
Level 1 : small level
Level 2
Level 3
Level 4 : large level

Note:
1. At Sound OFF, the buzzer does not sound.
2. The buzzer does not sound during sounding Entry buzzer.

5. 17. 6 Setting clock

The clock is set here.

[Setting items] The following items can be set.

- Date and time

[Operation screen] The setting can be performed on the following screen.

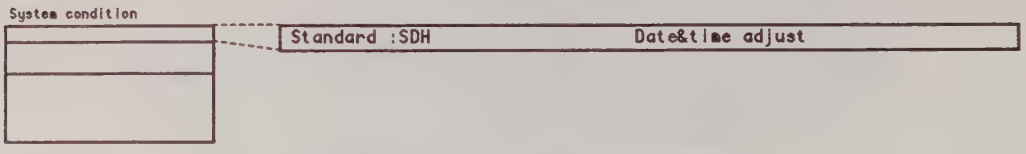


Fig. 5.17-14 Clock setting screen

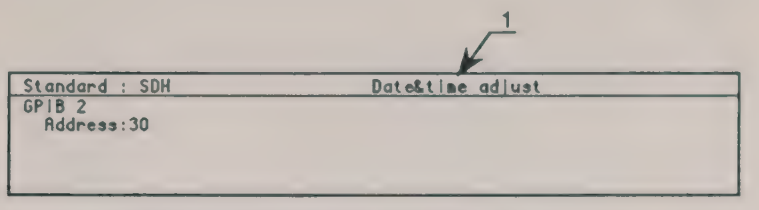


Fig. 5.17-15 Date and time settings

Date&time adjust

Sets the data and time at 1.
The setting range is as follows:

[Setting range]

Year	: 0 ~ 99 / step 1
Month	: 1 ~ 12 / step 1
Day	: 1 ~ 31 / step 1
hour	: 0 ~ 23 / step 1
min.	: 0 ~ 59 / step 1
sec.	: 0 ~ 59 / step 1

5. 17. 7 Setting panel lock

The panel lock is set here.

[Setting range] The following items can be set.

- Panel lock ON / OFF

[Operation screen] Setting can be performed by using the front-panel Panel Lock key.

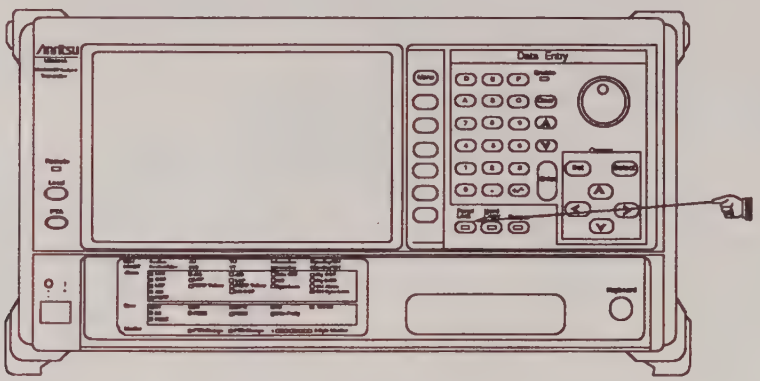


Fig. 5.17-16 Panel lock settings

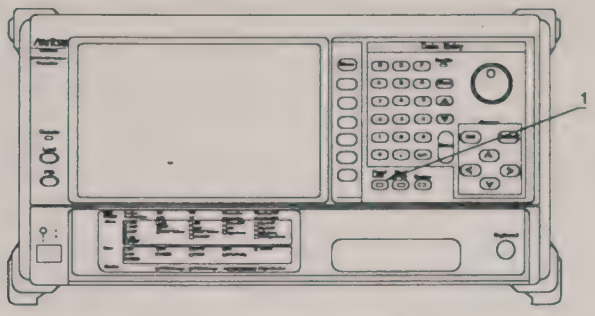


Fig. 5.17-17 Panel lock settings

Panel lock

Sets the panel operations enable status by the front-panel Panel Lock key at 1.
The setting range is as follows:

[Setting range] Panel lock OFF
Panel lock ON

Note:

1. At ON, the EL screen cursor and window screens are cleared. In addition, all keys other than the power switch and the Panel Lock key are disabled.
2. When the Panel lock is set from ON to OFF, the cursor reappears at the home position on the currently displayed screen.
3. At Hard copy ON, when the Panel lock is set to ON, the Hard copy key is set to OFF.

Anritsu Service and Sales offices

America

Anritsu Company (ACUS)

685-A Jarvis Drive Morgan Hill, CA
95037-2809, U.S.A.
Phone: +1-408-776-8300
Fax: +1-408-776-1738

Anritsu Company (ACUS-NJ) Dist.5

10 New Maple Avenue, P.O. Box 836
Pine Brook, NJ 07058-0836, U.S.A.
Phone: +1-973-227-8999
Fax: +1-973-575-0092

Anritsu Company (ACUS-Maryland) Dist.6

19630 Club House Road, #710
Gaithersburg, MD20879, U.S.A.
Phone: +1-301-590-0300
Fax: +1-301-216-2893

Anritsu Company (ACUS-Tx) NARO

1155 East Collins Blvd
Richardson, TX 75081, U.S.A.
Phone: +1-972-644-1777
Fax: +1-972-644-3416

Anritsu Electronics Ltd (ACCA)

5A-245 Matheson Blvd. East, Mississauga,
Ontario, L4Z 3C9, Canada
Phone: +1-905-890-7799
Fax: +1-905-890-2290

Anritsu Electronics Ltd (ACCA)

102-215 Stafford Road West Nepean,
Ontario, K2H 9C1, Canada
Phone: +1-613-828-4090
Fax: +1-613-828-5400

Anritsu Electronics Ltd (ACCA)

200-1405 Trans Canada Highway
Dorval, Quebec H9P 2V9, Canada
Phone: +1-514-421-3737
Fax: +1-514-685-9839

Anritsu Electronics Ltd (ACCA-Calgary)

Deerfoot Atrium, Suite 129, 6715-8th Street
N.E., Calgary, AB, T2E 7H7, Canada
Phone: +1-403-275-9855
Fax: +1-403-275-3609

Anritsu Eletrônica Ltd (ACBR)

Praia de Botafogo, 440-Sala 2401
CEP 22250-040, Rio de Janeiro, RJ, Brasil
Phone: +55-21-5276922
Fax: +55-21-537-1456

Anritsu Eletrônica Ltd (ACBR) Sao Paulo Branch Office

Praca Amadeu Amaral 27,
Primera Andar, Conj. 11, 12, 13, 14
Liberdade, Sao Paulo, Estado de
Sao Paulo, CEP : 01327-010, Brasil
Phone: +55-11-283-2511
Fax: +55-11-288-6940

Data Lab S.R.L

Edif. Ayfra, Pdte. Franco y Ayolas
Asuncion, Paraguay
Phone: +595-21-443-046
Fax: +595-21-441+935

Electro-Impex S.A.

P.O. Box 620-1000, San Jose, Costa Rica
Phone: +506-2-31-5701
Fax: +506-2-31-6531

Electronica 2000, S.A. DE C.V.

Blvd. Adolfo Lopez Mateos No.2016, Col.
Tlacopac, Del. Lopez Mateos, 01010,
Mexico D.F.
Phone: +525-662-8800
Fax: +525-662-5862

Electronic Engineering S.A.

Carretera de Circunvalavion, Sabanilla, Av
Novena, San Jose, Costa Rica
Phone: +506-2-25-8793
Fax: +506-2-25-1286

HDM Elquitecnica Cia. Ltda., Equitronics S.A.

Av. Republica de El Salvador, No.880,
Edificio, Almirante Colon 4to piso,
Quito, Ecuador
Phone: +593-9-704890
Fax: +593-2-48-2627

KRM Ingenieria Saciafs.

Viamonte 377,7° Piso 1053 Buenos Aires,
Argentina
Phone: +54-1-311-4165
Fax: +54-1-311-2297

SI Ltda.

E. Conchy Y Toro 65, Casilla 51888,
Santiago, Chile
Phone: +56-2-696-7534
Fax: +56-2-696-9665

Radiocom S.A.

Carrera 21 No.85-71, Conmutador
6100077, Santafe de Bogota, Columbia
Phone: +57-1-218-2054
Fax: +57-1-610-3272

Radiocomunicaciones cruz C.A.

Avda La Colina QTA. Elison, URB Colina
De Los Caobos, Caracas, Venezuela
Phone: +58-2-793-2322
Fax: +58-2-793-3429

Sakata Ingenieros S.A.

Av. Canaval Moreyra 840, Lima 27, Peru
Phone: +51-1225-7555
Fax: +51-1224-8148

Suministros Industriales S.A.

Casa 102, Calle 68 Este,
San Francisco, Balboa, Panama
Phone: +507-270-2328
Fax: +507-270-2329

Cabonorte S.A.

Colonia 1900, ESC. 603,
Montevideo, Uruguay
Phone: +598-2-430522
Fax: +598-2-418594

Europe

Anritsu Ltd (ACUK)

200 Capability Green, Luton
Bedfordshire, LU1 3LU, United Kingdom
Phone: +44-1582-433200
Fax: +44-1582-731303

Anritsu Ltd (ACUK-Manchester)

Kansas Avenue, Langworthy Park Salford,
Manchester M5 2GL, United Kingdom
Phone: +44-161-873-8041
Fax: +44-161-873-8040

Anritsu Ltd (ACUK-Bristol)

1230 Aztec West, Almondsbury
Bristol BS12 4SG, United Kingdom
Phone: +44-1454-615252
Fax: +44-1454-618017

Anritsu Ltd (ACUK-Livingston)

Unit 1, Knightsridge Industrial Estate
Turnbull Way, Knightsridge Livingston
EH54 8RB, United Kingdom
Phone: +44-1506-436111
Fax: +44-1506-436112

Anritsu GmbH (ACDE)

Grafenberger Allee 54-56
D-40237 Dusseldorf 1, Germany
Phone: +49-211-96855-0
Fax: +49-211-96855-55

Anritsu GmbH (ACDE-Sales Center South)

An der Steinernen Brucke 1 D-85757
Karlsfeld, Germany
Phone: +49-8131-3825-0
Fax: +49-8131-3825-95

Anritsu S.A. (ACFR)

9, Avenue du Québec ZA de Courtaboeuf 91951 Les Ulis Cedex, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

Anritsu S.A. (ACFR) (Toulouse Office)

Bureau de Toulouse
Région Centre Sud Ouest
Phone: +33-5-62070484
Fax: +33-5-62070668

Anritsu S.A. (ACFR) (Toulon Office)

Bureau de Toulon
Région Centre Sude Est
Phone: +33-4-94040264
Fax: +33-4-94040265

Anritsu S.A. (ACFR) (Rennes Office)

Bureau de Rennes
Région Ouest
Phone: +33-2-99521214
Fax: +33-2-99521224

Anritsu S.p.A. (ACIT)

Via Elio Vittorini, 129
00144 Roma EUR, Italy
Phone: +39-06-509-9711
Fax: +39-06-502-2425

Anritsu S.p.A (ACIT-Milano)

C.D. Colleoni, Via Paracelso, 420041 AGRATE B.ZA(MI), Italy
Phone: +39-039-65-7021
Fax: +39-039-605-6396

Anritsu AB (ACSE)

BOTVID CENTER
145 84 STOCKHOLM, Sweden
Phone: +46-8-53470700
Fax: +46-8-53470730

Anritsu AB-Norway Branch Office (ACNO)

Leangbukta 40 1370 Asker. Norway
Phone: +47-66-901190
Fax: +47-66-901212

Anritsu AB-Finland Branch Office (ACFI)

Piispanportti 9 FIN-02240 Espoo, Finland
Phone: +358-9-435-522-0
Fax: +358-9-435-522-50

Anritsu AB-Denmark Branch Office (ACDK)

SOHOJ 11, DK-2690 KARLSLUNDE Denmark
Phone: +45-46160330
Fax: +45-46155299

C.N. Rood B.V.

Cort van der Linddenstraat 11-13, 2288 EV Rijswijk ZH, The Netherlands
Phone: +31-70-3996360
Fax: +31-70-3905740

C.N. Rood SA/NV

Pontbeeklaan 45, 1731 Zellik, Belgium
Phone: +32-2-4668199
Fax: +32-2-4662500

ELSINCO GMBH

h.e. Strelbishte, str. Kotlenski Prohod, bl. 96/6/14, BG-1408 Sofia, Bulgaria
Phone: +359-2-58-61-31
Fax: +359-2-58-16-98

ELSINCO Praha Spol.

Novedvorska 994, CZ 142 21 Praha 4-Branik , Czecho Republic
Phone: +42-2-49-66-89
Fax: +42-2-49-54-83

ELSINCO Budapest KFT

Pannonia utca 8. IV/I.
H-1136 Budapest, Hungary
Phone: +36-1-269-18-50
Fax: +36-1-132-69-27

ELSINCO Polska Sp. Z.O.O

ul. Dziennikarska 6/1, PL 01 605 Warszawa, Poland
Phone: +48-22-39-69-79
Fax: +48-22-39-44-42

ELSINCO Bratislava Spol. s.r.o.

Kudlakova 4, SK 844 15 Bratislava, Slovakia
Phone: +42-7-784-165
Fax: +42-7-784-454

G'Amungason Co.

Skulagata 40, 101 Reykjavik, Iceland
Phone: +354-1-677887
Fax: +354-1-625045

GMP S.A.

Av. des Baumettes 19, CH-1020 Renens 1 Lausanne, Switzerland
Phone: +41-21-6348181
Fax: +41-21-6353295

Instrutek Oeriferi A/S

Christiansholmsgade DK-8700 Horsens, Denmark
Phone: +45-75-611100
Fax: +45-75-615658

Kostas Karayannis SA

58, Kapodistriou str., GR-142 35 Nea Ionia, Athens, Greece
Phone: +30-1-680-0460-4
Fax: +30-1-685-3522

Omnitecnica S.A.

Estrada Alfragide 2700 Amadora, Portugal
Phone: +351-1-471-55-17
Fax: +351-1-471-36-10

Pema Ltd.

Doromiskin, Dundalk, Co. Louth, Ireland
Phone: +353-42-72899
Fax: +353-42-72376

Unitronics S.A.

Plaza Espana 18, Torre de Madrid, Pl. 12-ofc. 9, 28019 Madrid, Spain
Phone: +34-1-5425204
Fax: +34-1-5591957

Wien CHALL GMBH

Krichbaumgasse 25, 1120 Wien, Austria
Phone: +43-1-811-55140
Fax: +43-1-811-55180

Asia, Pacific and Africa

Anritsu Private Ltd (ACSG)

6, New Industrial Rd., #06-01/02
Hoe Huat Industrial Building
Singapore 536199
Phone: 65-282-2400
Fax: 65-282-2533

Anritsu Company Ltd (ACHK)

Suite 719, 7/F., Chinachem Golden Plaza, 77 Mody Road, Tsimshatsui East, Kowloon, Hong Kong
Phone: +852-2301-4980
Fax: +852-2301-3545

Anritsu Company Incorporated (ACTW)

6F, 96, Sec. 3, Chien Kou North Rd.
Taipei, Taiwan
Phone: +886-2-2515-6050
Fax: +886-2-2509-5519

Anritsu Corporation, Ltd (ACKR) Head Office

14F Hyunjuk Bldg. 832-41, Yeoksam-dong, Kangnam-ku, Seoul, Korea
Phone: +82-2-553-6603
Fax: +82-2-553-6604~5

Anritsu Proprietary Ltd (ACAU)

Unit 3, 170, Forster Rd., Mt. Waverley
Victoria 3149, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

Anritsu Proprietary Ltd (ACAU)

Suite 304/2 Rowe Street Eastwood
NSW 2122, Australia
Phone: +61-2-9874-9044
Fax: +61-2-9874-9920

Anritsu Corporation Beijing Liaison Office

Room No.1515, Beijing Fortune Bldg. 5 Dong-San-Huan-Bei-Lu Chao-Yang District Beijing 100004, P.R. China
Phone: +86-10-6590-9230~9234
Fax: +86-10-6590-9235

Anritsu Corporation Shanghai Liaison Office

No.511 Shanghai Jing Tai Building No.58, Mao Ming Nan Rd. Sanghai 200020 P.R. China
Phone: +86-21-6415-5137
Fax: +86-21-6472-6677

Anritsu Company Ltd Guangzhou Representative Office

Room 720, 7/F., Dongshan Plaza, 69 XianLie Road Central. Guangzhou 510095 P.R. China
Phone: +86-20-8732-2231
Fax: +86-20-8732-2230

Anritsu Corporation New Delhi Liaison Office

Room No. 508, Prakash Deep, 7 Tolstoy Marg, New Delhi-110001, India
Phone: +91-11-331-9133
Fax: +91-11-371-3948

Associated Electric Trading Corp.

Zia Chambers, 25 McLeod Rd., Lahore, Pakistan
Phone: +92-42-722-1716
Fax: +92-42-7221456

Chris Radiovision Ltd.

Kouloumbris Building, 23 Crete Street, P.O. Box 1989, Nicosia, Cyprus
Phone: +357-2-466121
Fax: +357-2-365177

Electronic Equipment Marketing Co.

P.O. Box 3750, Riyadh 11481, Saudi Arabia
Phone: +966-1-4771650
Fax: +966-1-4785140

Etecsa (Pty) Ltd.

1st Floor Montrose Place, Waterfall Park, Bekker Rd., Midrand, South Africa
Phone: +27-11-315-1366
Fax: +27-11-315-2175

Giza Systems Engineering

2 El Mesaha Square, Dokki A.R.E., P.O.Box 1913, Cairo 11511, Egypt
Phone: +20-2-349-0140
Fax: +20-2-360-9932

Infotechs Ltd.

23-1, Jaya Rd., Colombo 4, Sri Lanka
Phone: +94-1-580088
Fax: +94-1-584644

Inter Muhendislik Danismanlik ve Ticaret A.S.

Farabi Sokak No: 24/14 Cankaya-06680 Ankara, Turkey
Phone: +90-312-4277792
Fax: +90-312-4277937

Jasmine Telecom Systems Co., Ltd.

333 Laksi Plaza 6th Floor, Tower 2, Chaengwatana Rd., Donmuang, Bangkok 10210, Thailand
Phone: +66-2-576-0200
Fax: +66-2-576-0420

Meera Agencies (P) Ltd.

A-23 Hauz Khas New Delhi 110 016, India
Phone: +91-11-685-3959
Fax: +91-11-685-2275

UAE Utmost Electronics Trading (L.L.C.)

P.O. Box 41175 Abu Dhabi, U.A.E.
Phone: +971-2-768909
Fax: +971-2-768907

Martwell Electronics Pvt., Ltd

3rd Floor, Francis House, Stanley Avenue, P.O. Box 1737, Harare, Zimbabwe
Phone: +263-4-793578
Fax: +263-4-737956

Mandeno Electronic Equip. Co.

463 Mt. Eden Rd. Mt. Eden, Aukland 1003, New Zealand
Phone: +64-9-630-7871
Fax: +64-9-630-1720

National Projects and Technology Co. L.L.C

P.O. Box 97, Wadi Al Kabir, Postal Code 117, Sultanate of Oman
Phone: +968-791704
Fax: +968-791697

O'Connors Engineering & Trading (Malaysia) Bhd

3rd Floor, Wisma Siong Huat, Lot 13, Jalan 51A/223 46100 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Phone: +60-3-757-2828
Fax: +60-3-757-7871

P.T. Subur Sakti Putera

Jalan Musi No.32, Jakarta 10150, Indonesia
Phone: +62-21-3803644
Fax: +62-21-3845043

Qatar Communications Ltd.

P.O. Box 2481, Doha, Qatar
Phone: +974-424347
Fax: +974-324777

Trading and Agency Services

P.O. Box 1884, Doha, Qater
Phone: +974-432212
Fax: +974-422255

Rajab & Silsilah & Co.

P.O. Box 203 Jeddah 21411, Saudi Arabia
Phone: +966-2-6610006
Fax: +966-2-6610558

Salritsu International Trading Corporation

50B ODC International Plaza Condominium, 219 Salcedo St., Legaspi Village, Makati, Metro Manila, Philippines
Phone: +63-2-816-2646
Fax: +63-2-815-0986

Sedel

24, 26, Bd, Resistance, Casablanca, Morocco
Phone: +212-2-302444
Fax: +212-2-449311

Superior Electronics Associated

B-98 Block H, North Nasimabad, Karachi-33, Pakistan
Phone: +92-21-613655

Tareq Company

P.O. Box 20506 Safat, 13066 Safat, Kuwait
Phone: +965-2336-100
Fax: +965-2437-700

Tech-Cent Ltd.

Haarad St. No.7, Ramat Haahayal, Tel-Aviv 69710, Israel
Phone: +972-3-6478563
Fax: +972-3-6478334

Test

Sehit Adem Yavuz Sokak No.6/17, Kizilay-Ankara, Turkey
Phone: +90-41-71086
Fax: +90-41-74384

Japan

Head Office

5-10-27, Minamiazabu, Minato-ku, Tokyo 106-8570
Phone: 03-3446-1111
Fax: 03-3442-0235

Atsugi Factory

1800, Onna, Atsugi-si, Kanagawa 243-8555
Phone: 046-223-1111
Fax: 046-225-8379

If you have any comments on this manual, please e-mail them to Manual-support@zz.anritsu.co.jp.

Anritsu

ANRITSU CORPORATION
5-10-27, Minamiazabu, Minato-ku, Tokyo, 106-8570 Japan
PHONE. 03-3446-1111
TELEX J 34372 ANRITU